CHEMICAL INDUSTRIES

FORMERLY KNOWN AS "CHEMICAL MARKETS"

VOLUME XXXVII OCTOBER, 1935 NUMBER 4

Contents for October, 1935

Regular Departments

CHEMICAL INDUSTRIES *is indexed regularly in the* INDUSTRIAL ARTS INDEX

CHEMICAL INDUSTRIES is published monthly by Chemical Markets, Inc. WILLIAMS HAYNES, *President*; H. H. ADAMS, *Vice-President*; WILLIAM F. GEORGE, *Secretary-Treasurer.*

Published on the tenth day of each month at New Haven, Conn., and printed for the publishers by the Tuttle, Morehouse & Taylor Company.

Entered as second class matter, December 22, 1934, at the Post Office at New Haven, Conn., under the act of March 3, 1879.

SUBSCRIPTION RATES are: domestic, two dollars in advance, Canadian and foreign, three dollars a year; single copies of the current issue are twenty-five cents each, back issues fifty cents each. Notice of three weeks is necessary in order to change subscriber's address, and in notifying, kindly give both the old and the new addresses.

PUBLICATION OFFICE, NEW HAVEN, CONN. EDITORIAL AND ADVERTISING OFFICES, 25 SPRUCE ST., NEW YORK, N. Y.

CHEMICAL INDUSTRIES

FORMERLY KNOWN AS "CHEMICAL MARKETS"

VOLUME XXXVII OCTOBER, 1935 NUMBER 4

Contents for October, 1935

CHEMICAL INDUSTRIES *is indexed regularly in the* INDUSTRIAL ARTS INDEX

Publication Staff

Williams Haynes
Publisher and Editor

A. M. Corbet
Assistant to the Editor

Walter J. Murphy
News Editor

William F. George
Advertising Manager

J. H. Burt
Production Manager

CHEMICAL INDUSTRIES is published monthly by Chemical Markets, Inc. WILLIAMS HAYNES, *President*; H. H. ADAMS, *Vice-President*; WILLIAM F. GEORGE, *Secretary-Treasurer*.

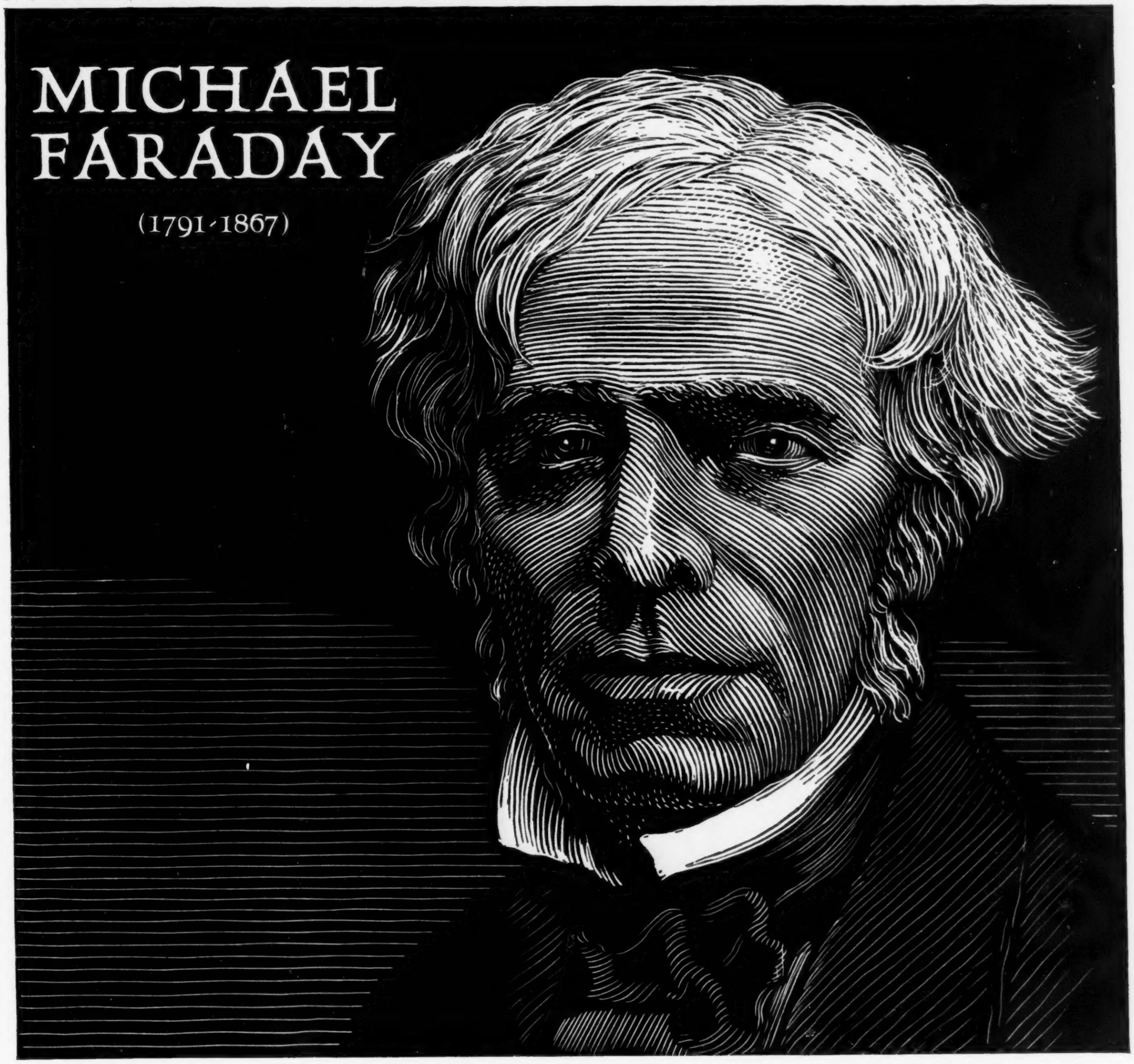
Published on the tenth day of each month at New Haven, Conn., and printed for the publishers by the Tuttle, Morehouse & Taylor Company.

Entered as second class matter, December 22, 1934, at the Post Office at New Haven, Conn., under the act of March 3, 1879.

SUBSCRIPTION RATES are: domestic, two dollars in advance, Canadian and foreign, three dollars a year; single copies of the current issue are twenty-five cents each, back issues fifty cents each. Notice of three weeks is necessary in order to change subscriber's address, and in notifying, kindly give both the old and the new addresses.

PUBLICATION OFFICE, NEW HAVEN, CONN. EDITORIAL AND ADVERTISING OFFICES, 25 SPRUCE ST., NEW YORK, N. Y.

NUMBER TWO OF A SERIES OF FAMOUS PIONEERS IN CHEMICAL HISTORY



MICHAEL FARADAY, best known for his pioneer work in experimental electricity, was also a pioneer in the liquefaction of gases, notably chlorine. Thus, early in the 19th century, he laid the groundwork both for the modern electrolytic manufacture of chlorine and for present-day methods of chlorine distribution. Nearly a hundred years passed, however, before liquid chlorine came into its own as an important industrial commodity. Mathieson, first to manufacture chlorine products in the United States, has always been in the forefront of new developments in the production, distribution and efficient application of liquid chlorine.

The MATHIESON ALKALI WORKS (*Inc.*), 60 East 42nd St., New York, N.Y.

On March 5, 1823, a visiting scientist at the Royal Institution, London, criticized Michael Faraday for using soiled glassware in his experiments with chlorine hydrate. The next day the visitor received a note from Faraday reading: "Dear Sir: The oil you noticed yesterday turned out to be liquid chlorine. Yours faithfully, Michael Faraday."

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH AND HTH-15 . . .

Mathieson Chemicals

AMMONIA, ANHYDROUS AND AQUA . . . PH-PLUS (FUSED ALKALI) . . . SOLID CARBON DIOXIDE . . . CCH (INDUSTRIAL HYPOCHLORITE)

The Reader Writes:—

Two Postscripts to Chemical History

Shortly after the Civil War my grandfather, George T. Lewis, sent my uncle, Samuel N. Lewis, then recuperating from typhoid fever, contracted while serving as a Union soldier, to Denmark, along with Henry Pemberton, in an attempt to obtain a concession to import Cryolite into the United States from Greenland.

After a long stay in Denmark, these gentlemen were successful, and when they were handed the concession the Danish authority said that his Government had heard of the great War in America and knew that North America had won and that America was now all one country. He said that, therefore, his government delivered the sole concession to import this mineral into both North and South America.

Another amusing incident occurred at a dinner party in Copenhagen, during the negotiations. It appears that Americans at that time wore square-toed shoes, and the Europeans wore pointed ones. Samuel Lewis, when called on for a few remarks toward the end of the dinner, said he had noticed a number of the diners looking with surprise at the shape of the ends of his shoes. He said the explanation was that the Americans were a very impulsive people, and they often could not control their feet when aroused.

It therefore, he said, had been made a criminal offense in America to wear pointed-toed shoes.

Samuel Lewis said that when he sat down Mr. Pemberton (the older man) looked at him very solemnly, but the Danes were inclined to believe the story.

Philadelphia, Pa. G. Lewis Mayer.

In an article dealing with the history of Merck & Company, published in your May, 1935, issue, you mention the fact that Major Adolph G. Rosengarten "was killed in a cavalry charge at the battle of Murfreesboro, Tenn." The exact circumstances of his death were related to me by my father who took part in this battle as a member of Company A, Tenth South Carolina Volunteers.

It appears that Major Rosengarten (I understood from my father that he had a higher rank) had separated or become separated from most of his command, and had ridden into a corner where he and his staff were surrounded by Company A and called upon to surrender. The bridle of Rosengarten's horse was seized by Tim Harrison; whereupon the Major, causing his horse to rear, whipped out a revolver and shot Harrison dead, only to be immediately shot down himself.

I related these facts to George D. Rosengarten, who told me that this was the first time he had heard the details of his uncle's heroic death. A small volume published some years after the war gives a history of the Tenth South Carolina Volunteers and their hard service under trying conditions, without adequate food and munitions, until General Johnson surrendered to General Sherman at Greensboro, N. C. The death of Tim Harrison is recorded, and my recollection is that, despite replacements, there were only about fifty effectives left in the regiment at the time of the surrender.

The true spirit of the Southern army was not revealed in the history texts of my time, when it was still the fashion to "wave the bloody shirt." I have a letter of my father written from Tennessee to his mother and sister at Charleston, S. C., in which he states: "I am hopeful that heavy fighting is to take place this spring to decide whether we shall be freemen or vassals of the North." The Southern Army was then outnumbered about five to one, and they knew it; but they were Americans fighting for the right as they saw it, and not for the slaves, who had, incidentally, been brought into the South by New England clipper ships as part of the "triangular" voyage: 1—From Boston with a cargo of Medford rum to the "slave coast" in Africa; 2—With a cargo of "black-birds" from Africa to New Orleans or other Southern ports; 3—Back to Boston with cotton, sugar, rice—and molasses to make more rum.

But the South survived the "carpet-baggers" and other evil consequences of the murder of the understanding and big-hearted Lincoln by an insane fanatic. It is now *plus royalist que le roi* in its Americanism.

New York City Dr. Jerome Alexander

Wants More Lambasting

Why have you laid off pounding the super-inanities of "The New Deal"? Don't think that just because N.R.A. has been scrapped by the Supreme Court that the wild man we have in the White House is tamed or that his cracked-brained Brain Trust has learned anything. They are still capable of doing irreparable damage to this country and its industries and its cherished institutions.

Keep pinning the responsibility on Roosevelt for our delayed recovery and our high costs of living and our wild waves of socialistic sentiments.

Cincinnati, Ohio Robert P. Sessions

A Suggestion For Simplification

Your editorial (August, 1935) praising the Phosphate Institute recalls to my mind earlier editorials of yours advocating the consolidation of a number of our technical societies and our trade associations into two large, powerful, unified bodies to care for the scientific and industrial interests of chemistry in America. This always appealed to me as a sensible idea.

Having had some experience in trade association work, I am of the opinion that the real stumbling block is the pride of a small group of men in each of the various associations who mulishly refuse to sink their egoistic love of a few titles and a little power, for the common good, in a merger of these semi-public services. I am also sure that the logical amalgamations could be forced by the executives of half a dozen of our leading chemical corporations by simply withdrawing all support of and participation by both the company and its staff in any secondary association which reason dictates ought to be merged.

The bugaboo of improper representation of special interests, either technical or commercial, can be laid low provided the merged associations were organized upon the general plan of a Congress with proper sections and even sub-sections devoted to definite and important branches of the general organizations' activities.

Such centralized organizations would save much money in administrative expenses and be able to do their appointed tasks better. Fewer and bigger meetings would save much in time and convention expenses. Among the technical and scientific organizations, there could be effected a very badly needed check upon the flood of current chemical literature which has long ago drowned out any hope that the ordinary chemist can keep abreast of present day publications. Among the trade associations the advantages of a common meeting place and the means of presenting a united front have too often been proved during the past two years to need any further evidence from me.

Washington, D. C. H. Eastman Hall

CHEMICAL INDUSTRIES

VOLUME XXXVII NUMBER 4

Wolf! Wolf!

RECENT warnings against inflation, notably that of Melvin T. Copeland, have widely called forth only disparaging comment. It is the present fashion to regard inflation prophets as successors of the technocrats and all such ilk of foolish economic faddists. Their warnings are openly jeered at as the cry of "Wolf! Wolf!" when lo! no wolf cometh.

The present feeling of security is historically correct. For the well-known course of an inflation begins by a government spending more than its income. At the outset this rouses alarm, but as the price level rises, trade briskens, and false confidence fathers the wish to believe that, once normal business activity is restored, greater tax receipts will automatically balance the budget. But the business activity is abnormal; government expenses are not cut sufficiently; the inflationary causes become as inevitable and irresistible as gravity. The course of inflation has never been stopped under the political party which initiated it, since this demands drastic measures that are political suicide.

These perfectly well-known facts do tally uncomfortably with what is happening. Last year our Government spent 3500 millions of dollars more than its income and will spend this year 4500 millions on the wrong side of the budget. Food prices—always the first to soar—have already roughly doubled. There is plenty of talk of retrenching government expenses; but well-known examples already make plain the political difficulties involved. There are still over 7000 employees of the legally dead N. R. A. on our payroll, and the President has already twice compromised with the bonus issue.

If the analogy holds it may be well for us all if the cost of living so rises during the coming twelve months that inflation becomes a political issue. Even our great strength could not withstand five more years of unbalanced budget and soaring fictitious values. The alternative would be a political revolution.

The Industrial Point of View

Lord Melchett has persistently advocated co-operation in British industry and has crystallized his ideas in a bill which he introduced last Spring in the House of Lords, providing that decisions of trade associations, reached by a majority vote, shall be given compulsory powers. This is reminiscent of the law-making powers of our codes, and in retrospect it is interesting to note the findings of a committee of the Federation of British Industries (an association of trade associations not unlike our own Chamber of Commerce of the United States) appointed to canvass industrial opinion.

The consensus of that opinion was that the proposal would be an undesirable extension of bureaucratic powers, and that the best interests of British industry could not be served by compelling the minority to obey the dictates of the majority of any business group. It was particularly pointed out that the minority often represented the most independent, vigorous, and progressive members of an industry, and that while it might often appear to be advantageous to prevent expansions of productive capacity or to uphold legally price, wage, and marketing agreements, nevertheless that compulsory methods would endanger freedom of thought and action essential to individual security and industrial progress. If an industry cannot voluntarily agree upon a united course of action, it was felt strongly that there must be certain good reasons why it would be dangerous to override.

The strength and clarity with which these views are presented to Parliament are in stimulating contrast to the stupid and supine efforts made by American industry to present the business point of view in Washington. This British report says in plain words that the Government should appreciate, as it often failed to do in the past, that the whole national structure is dependent upon industry and that it must help industry to attain maximum efficiency.

Who in this country remembers that since 1910 the United States has been predominantly an industrial nation?

Chemical Accounts

Out of Wall Street has come the suggestion that along with its balance sheet any corporation in the chemical process industries should file a sort of certified chemical account, an expert, outside appraisal of technical efficiency and research competency. It is an engaging thought and one guesses with ease what an appeal it must make to a conscientious trust officer struggling to weigh the sound investment qualities of chemical securities. It would provide him with an alibi almost as perfect as a deliberately falsified financial statement. Nevertheless, we suspect that these certified chemical accounts would prove of practical value only to the stock market speculator, for we cannot see how they might be made of very much more use than any tipster's dope sheet. It is perfectly practical to rate against a theoretical perfect the efficiency of each given chemical process for power, heat, raw materials, and what not; and it might be embarrassing, but not impossible, to take the "I.Q." of the research staff from director to bottle boy. But there is no common denominator for B. T. U.'s and Ph.D.'s. Even if there were, a scrupulous chemical accountant must needs write into every equation an "x" to represent the unknown quantity of competition.

A Decline and an Advance

The most important price movements of the past month occurred in the paint raw materials markets. Totally unexpected was the drastic slash of from 15 to 40 per cent. in the quotations for zinc oxide, while paint manufacturers are beginning to feel the pinch more severely from the rapidly advancing Chinawood oil market.

Producers of zinc oxide are not very definite in their explanation as to the reasons for the decline, but, certainly, the expansion in the consumption of titanium pigments by both the paint and rubber fields is one reason. Others are the competition provided along the Atlantic seaboard from importers of the French process zinc oxides and the domestic competition of certain of the smaller producers who have been making American process zinc oxides out of secondary metal. Present reduction is only in effect until the end of the year. With the zinc metal market showing a steady rise the outlook for the continuance of these figures into 1936 is problematical.

The acute shortage of Tung oil is more vividly illustrated by the recently reported sale of fairly large amounts by several smaller paint companies who found that it was more profitable to sell their commitments of oil than to make paint. The situation was dwelt upon at great length by President Trigg of the National Paint, Varnish and Lacquer Association in his talk before the N. Y. section, last month. The scientific division is making every effort to locate possible substitutes but definite relief is still quite a distance off.

Our First Great Chemical Enterpriser

George T. Lewis.

EVERY industrial enterprise is born in the imagination of some man who conceives an opportunity to make some useful goods at a profit to himself. A century ago there were but few men who could visualize commercial opportunities in the manufacture of chemicals. In truth such opportunities were then extremely limited. Furthermore, they were attended by all the extraordinary risks of industrial pioneering. To venture into the business of making chemicals at that time, a man must be possessed of the reckless spirit of the gambler and the certain vision of a prophet. To succeed as a manufacturer of chemicals in those days of personal management required dogged perseverance and the soundest of good judgment.

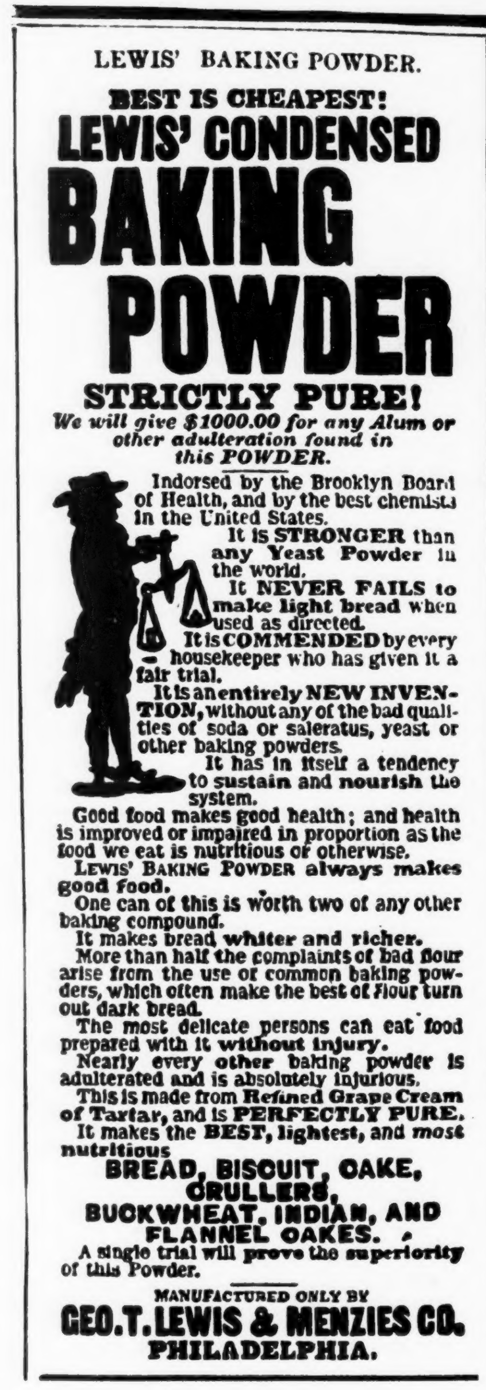
If for no other reason than that they possessed this rare combination of talents, our pioneer chemical industrialists were all notable men. Not one of them was so distinguished by the ability to visualize a chemical opportunity as George T. Lewis.

He was our first great chemical enterpriser. He was associated with the first production in America of caustic soda. He was a leader in the commercial development of the Carolina phosphate rock deposits. He was one of the first refiners of cottonseed oil. He was instrumental in bringing the mineral kryolith from Greenland to the United States and employing it as a chemical raw material. Although he was the actual executive head of no chemical company, nevertheless he was the moving spirit behind three important chemical enterprises. Under his leadership the Lewis family interests in the production of white lead were expanded and diversified with other chemical products. To his experience and energy the New Jersey Zinc Company owes its existence. He was literally, as he was once called, "the Father of Penn Salt."

He was no chemist, yet with the devotion of a true scientist he spent his life in solving the economic problems of chemistry. Upon several occasions this absorbing interest of his in chemical developments kept him from associating himself with other infant industries which have since grown to great giants. He turned his back on tempting opportunities to play an important and personally profitable rôle in the steel, coal, and petroleum industries, not because he was blind to those opportunities, but because he held fixed before him his vision of chemical opportunity.

This same dominating thought prompted him to hold the companies with which he was closely associated strictly in the chemical field. When difficulties arose, he sought a chemical solution of the problems. When expansions were planned, he resisted the temptation to branch out into new lines. His was always a thoroughgoing chemical policy, and these companies, as we know them today, are the fruits of the chemical seeds he planted and so carefully cultivated.

The focus of his attention upon chemical enterprises, sustained to the very end of his long life, must have been directed by some strong inner conviction. Certainly there was little in his family or educational background to have supported such whole-hearted devotion to the chemical industry. His schooling never included so much as a single lesson in chemistry, and in later years, despite his keen interest and heavy investments



This Lewis' Baking Powder advertisement appeared in the Illinois State Journal, Springfield, Ill., on December 5, 1879.

in chemical operations, he never saw fit to study a chemistry textbook or attend a chemical lecture. Naturally, so eager and industrious a man, closely associated with a variety of chemical operations, could not fail to pick up a considerable store of practical chemical knowledge, and almost unconsciously he became quite an expert in certain phases of chemical engineering, notably in smelter fumes recovery. Throughout his career, however, he depended upon others for his technical facts, and his concentration upon chemical enterprises certainly was not the result of an abiding preoccupation with chemical processes as such. Nor can the compelling fascination which the chemical industry exercised over him be explained as an inherited trait. It is true that his father and uncle had embarked upon the manufacture of white lead; but this chemical enterprise was always to them a side-line, a supplement, as it were, to their importing business. It was a venture in the spirit of the times when a number of the old trading houses were investing surplus funds in small manufacturing plants whose output they thus controlled and whose products they sold along with the multitude of miscellaneous imported goods they regularly handled. The Lewis family tradition was conspicuously mercantile, not chemical.

George T. Lewis was in the sixth generation in America of an ancient Welsh family, and from his father to his great great grandfather, four of these generations had been merchants and ship owners. William Lewis, first ancestor of the American branch of the family, came to this country in 1686, four years after the arrival of William Penn; and being himself a member of the Society of Friends, naturally settled in Penn's colony. He was descended from the illustrious family of Lewis of the Van, whose proud title traces back to Teon, the son of a long line of British princes, who at the close of the Fifth Century was Bishop of Coer Loew (now Gloucester) and later of London, from which city he was forced, by the invasions of the pagan Saxons, to flee to a refuge in the mountains of Wales. The same proud title, Lewis of the Van, is to this day borne by the stately ruins of the family seat in Glamorganshire in South Wales.

William Lewis, when he came first to Penn's colony, settled in Haverford Township not far from the present Wynnewood Station of the Pennsylvania Railroad; but he later removed to a large farm in Newton Township. His son Evan, who was born June 7, 1677, left the farm of rolling acres in Chester County and moved to the growing town of Philadelphia. Here, in a modest little shop, he launched out in the mercantile line, to be succeeded in due time by his own son, Jonathan, who was born July 26, 1726, and who on August 30, 1747, married Rachel Brentnell. Jonathan and Rachel Lewis had but one son, born September 21, 1749, and christened Mordecai after his maternal grandfather.

Mordecai Lewis greatly advanced the family fortunes. From small shopkeeper he grew into a great merchant, importer of foreign wares, exporter of colonial produce of all sorts, a ship owner and financier. He amassed a great fortune and built a fine house on Front Street, with his office and counting house just behind fronting on Dock Street. He was one of the prominent and responsible men of Philadelphia selected by his fellow citizens to countersign the paper money of the colony and later of the State of Pennsylvania. He took an active part in several of the public institutions of the city and in 1780 was elected treasurer of the Pennsylvania Hospital, to which post he was succeeded in turn by two of his sons and by his grandson,

the office remaining continuously in the family for one hundred and one years.

Mordecai Lewis died March 13, 1799, at the comparatively early age of fifty-one, and he was succeeded by his son, Mordecai, Jr., who in 1806 took into partnership with him his younger brother, Samuel Neave Lewis, under the firm name of M. & S. N. Lewis. Three years later Samuel Neave Lewis married Rebecca Chalkley Thompson. Their fifth child, born August 3, 1817, was George Thompson Lewis who, like his illustrious grandfather, was named after his mother's father.

The young firm of M. & S. N. Lewis continued in the business so successfully established by Mordecai Lewis, Sr., as commission merchants and ship owners. They prospered, and as young men are naturally inclined to do, began to branch out into new lines. As far back as 1772, their grandfather, Jonathan, had begun to import white lead, and this valuable paint pigment had long been one of the important items on the manifests of the Lewis ships. In 1813 Joseph Richardson had begun to manufacture white lead in a small factory on Pine Street, out in the suburbs between Fifteenth and Sixteenth Streets. By 1819 his output had grown to the sizable total of a hundred tons a year and he began to attract the attention of the Lewis brothers. Seeing in him a threatening rival to one of their old and most profitable lines, they bought Richardson out, and so successful did the enterprise prove that by the end of ten years they had multiplied the production sixfold and by 1840 were manufacturing a thousand tons of white lead annually. As early as 1827, they started the manufacture of acetic acid (to take the place of the vinegar they were using in their process) and in 1830 they began to crush flaxseed and to market linseed oil to their paint-making customers.

It was shortly after these preliminary expansions of the white lead manufactory—in 1834 to be exact—that young George T. Lewis came to work in the counting house of the great firm in which his father was junior partner. At the time he was only sixteen years old; but he had completed the regular courses in the public and private schools of the city, and recognizing that he was not a natural student, his father acceded to his earnest plea to be allowed to enter business. His older brothers, John T. and Saunders Lewis, were already at work with the firm and like them young George was started at the bottom rung as a clerk in the accounting department. His strong natural bent for chemical enterprises soon brought him into the white lead factory.

The city of Philadelphia was growing fast. Fashionable Front Street where grandfather Mordecai had built his mansion had been usurped by business, and in 1816 M. & S. N. Lewis had torn down the old home and rebuilt an office and warehouse at 135 (now 231) South Front Street. The fine residential section was moving uptown along Chestnut and Walnut, Spruce and Pine, so that the full square block from Pine to Lombard, between Fifteenth and Sixteenth, where the white lead plant stood, was becoming altogether too

Photograph of George T. Lewis made in June, 1869.

valuable real estate for manufacturing purposes. The property was sold in 1848 and in 1849 the operation re-installed at Duke and Huntington Streets, in Port Richmond. An old white lead factory had stood on this site, but the plant was entirely revamped and enlarged. This work was all carried out under the direct supervision of George T. Lewis, and it was his inspiration that prompted the addition of such closely allied products as red lead, orange mineral, litharge, and acetate of lead.

The following year the old firm of M. & S. N. Lewis was formally dissolved. Both of the original partners had died, and the sons of Samuel Neave Lewis, who had inherited the business, agreed that the manufacturing and trading departments had so grown that they should be operated separately.

Accordingly, the firm of John T. Lewis & Brothers was organized in 1856 to take over the lead pigment business. Although he was the master spirit in this enterprise, George T. Lewis, with characteristic self-effacement, placed his brothers in active control, while he himself continued as commission merchant under his own name. It was agreed at the time that, in his capacity as commission merchant, George T. Lewis would sell the products of the Lewis lead factory.

This connection was the basis of other similar arrangements and was the true bond between him and a number of chemical enterprises. Because he sold packaged lye and baking powder, he became interested in the manufacture of caustic soda and alum, and it was

his trade in fertilizers that suggested to him the organization of a company to mine the recently discovered phosphate rock deposits of South Carolina.

This venture, the Charlestown Mining and Manufacturing Company, was one of George T. Lewis' first and most successful chemical enterprises. He organized this company which soon became one of the largest in this field. Their own holdings in South Carolina were ten thousand acres of the very richest phosphate deposits, and they made mining leases for over twelve thousand additional acres. At the peak of the exploitation of the Carolina fields their annual sales were greater than a million dollars, and with the exhaustion of those fields they providently transferred their operations to Florida. Eventually the company was transferred to interests allied with the Virginia-Carolina fertilizer merger.

As early as 1847, George T. Lewis brought cottonseed from the South to his own mill in Philadelphia and began crushing it. It was his belief that cottonseed oil would become a substitute for linseed, and when the paint trade could not make this substitution instead of abandoning the project, he engaged a chemist, worked out a method of refining his cottonseed product, and sold it for use in oil-burning lamps and in soap making.

While in close personal touch with the manufacture of white lead, he proved himself one of our first chemical conservationists by working out a successful method for the recovery of lead in the smelter fumes that had formerly gone to waste. As was his custom, in attacking this problem he associated with himself a good technical man; but the practical experience he gained in this way at first-hand enabled him years later to regenerate the Lehigh Zinc Company by furnishing plans for the first successful zinc furnace built in the United States and also to build for the New Jersey Zinc Company a practical furnace for producing the metal from the rich, but difficult Franklinite ores.

Just at the time of the dissolution of the old firm of M. & S. N. Lewis, Dr. Richard Tilghman, a prominent physician and member of the distinguished Eastern Shore family, came to Philadelphia from Baltimore with a chemical idea expressed in the tangible form of a patent covering a new process "for the manufacture of the alkaline salts of soda." George T. Lewis, who at the time was on the outlook for new business opportunities, and Charles Lennig, the aggressive proprietor of the largest heavy chemical works in Philadelphia, were naturally among the first wealthy men the inventor approached. They were both favorably impressed by the doctor's representations and the commercial possibilities of his process. After a long series of conferences, they agreed to buy the Tilghman patent outright for twenty-five thousand dollars.

Meanwhile other important Philadelphians had become interested in this proposed chemical enterprise, and it was finally agreed to organize a new corporation to acquire the patent and work the process. Accordingly, on September 25, 1850, a charter was obtained "for a period of ten years and for the purpose of manufacturing salt and its resultant products" for a company with twenty shares of five thousand dollars each, all subscribed and paid in. Thus, the Pennsylvania Salt Manufacturing Company was launched.

Bust of Mr. Lewis completed about 1900.

The original board of directors, consisting of Charles Lennig, president, George T. Lewis, George C. Carson, Samuel Sims, and Samuel F. Fisher, with George Thompson as secretary and treasurer, drew up a carefully planned program. Of their one hundred thousand dollars working capital, a quarter was by agreement invested in the Tilghman patent. They next assured themselves of control over their raw materials by purchasing twenty-nine acres of land with proved salt reserves underground and including a coal privilege 500 feet on the front line and one mile in depth. At the same time they took an option on additional coal privileges of 150 acres at thirty dollars per acre. For this property they paid $5750.00, leaving them as working capital $69,250.00. Subsequently their cautious investment in land proved costly, for the Company was later forced to pay up to as high as six thousand dollars an acre for land that they might then have purchased for not more than fifty dollars. However, had they bought a couple of thousand acres, as their successors devoutly wished they might have done, either the orig-

inal investment must have been doubled or else the available cash would have been so depleted that it is doubtful whether the enterprise could have struggled through its first seven very lean years.

The situation as they saw it, and as it developed during the early life of the Company, fully justified their conservative investment in land; and they were certainly more than justified in the caution with which they proceeded in their manufacturing operations.

With a new process to translate from patent to plant, they decided to entrust the experimental work to experienced Charles Lennig, and before building their own plant to employ his existing manufacturing facilities. Having tied him tightly with an extremely carefully drawn operating agreement, they turned the process over to him, and he took it out to his works at Bridesburgh for trial. At the same time they sunk wells, installed brine pumps, and erected the outer frame of their plant buildings on the newly acquired land at Natrona, near Pittsburgh.

Charles Lennig could not produce the alkaline salts of soda according to the specifications of the Tilghman patent. For two years he tried to do so, and then after some rather costly modifications of apparatus, the process was transferred to the new Natrona plant. The process could not be made to work. It proved a discouraging and costly failure. In 1854 the directors resigned. Dissolution of the corporation was freely discussed. But the old board was re-elected, and it was at this low point in the corporation's affairs that George T. Lewis earned his title of "Father of the Salt Company."

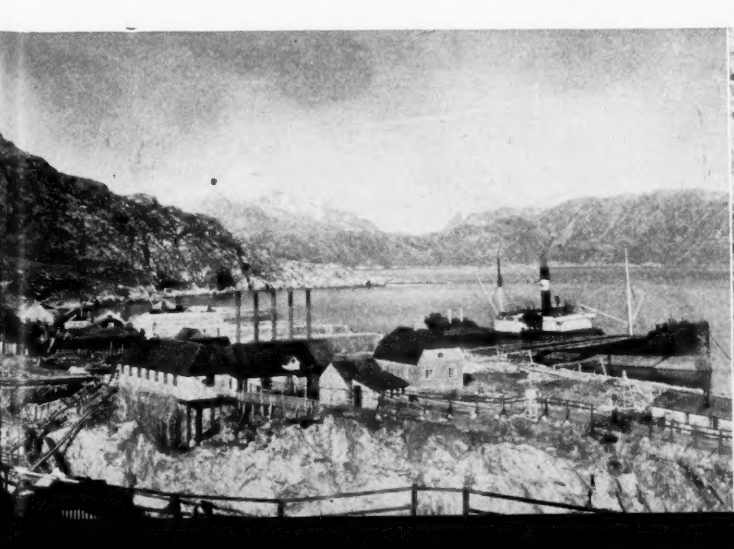
He was insistent that they find a chemical solution for the problem. As a stop-gap the company had been selling salt; but he pointed out the ruinous competition from the Ohio Valley wells and convinced his associates that their future lay not on salt, but in "its resultant products." Investigations were started into the use of salt as a chemical raw material, especially looking to the production of soda ash, which were later described as "the foundation of our business and security for further proposed investment."

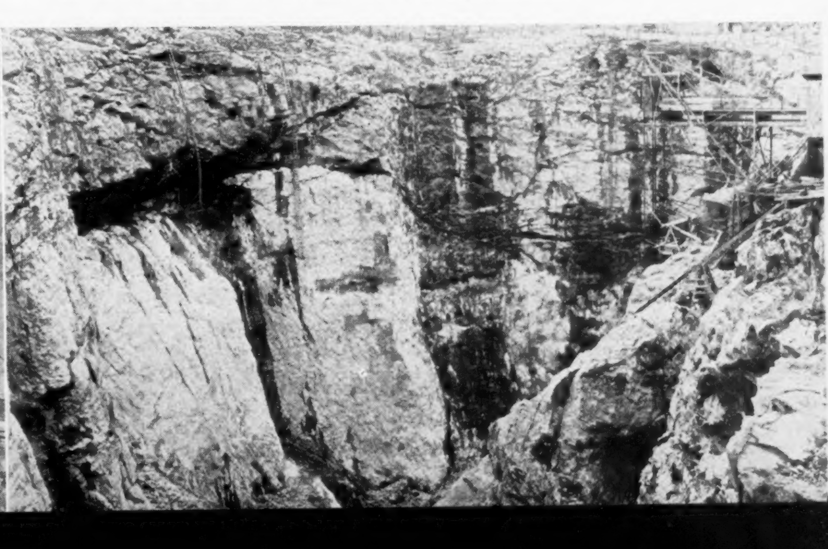
In 1856 the first net profits, a modest $1047.58, were earned, and that same year a patent was secured for George Thompson's famous "Saponifier." So convinced was Mr. Lewis of the ultimate success of the enterprise and of the value of this Thompson patent, that he not only advanced the better part of $100,000 for additional plant and continued chemical investigations, but he also agreed to take over the sales of the "Saponifier."

The substitution of the cheaper caustic soda for caustic potash, which had previously replaced the messy and unreliable hardwood ashes in the home manufacture of soap, was a revolutionary household convenience that today we cannot appreciate. Seventy-five years ago, a cake of hard soap bought in the store was a luxurious toilet article even to the majority of city dwellers. Most of the cleaning and laundry soaps were home-made; and more than that, packaged lye, before our multiplicity of water softeners and scouring powders, was the popular cleansing agent. It became the basis of a tremendous business, the foundation of such familiar chemical trade-names as Ford and Babbitt, and it supplied the beginnings of the Guggenheim family fortunes. From Ford has sprung the Michigan Alkali Company. The Babbitts went on to the manufacture of soaps. The Guggenheims sold out their famous "American" brand of lye to George T. Lewis and on the advice of one of the sons invested it in Montana copper-mining operations. But from the earliest days till now Lewis Lye has been a leader in this field.

Allied with the sale of packaged lye in his business as commission merchant, George T. Lewis carried alum baking powder and disinfecting chlorides, products which were made for him by the Pennsylvania Salt Manufacturing Company. It was his natural interest in alum that turned his attention to that curious mineral kryolith, a double sodium and aluminum fluoride found in commercial quantities only in one vast deposit on the south shore of Greenland owned by the Danish Government. This single commercial deposit is of enormous extent, the main mass being six hundred feet in length, two hundred in width, and of still unknown depth; and it is moreover of exceptional purity, whole cargoes sometimes running over 98 per cent. pure kryolith. About 1850, a young Danish chemist, Julius Thomsen, worked out a commercial process for the use of this mineral as a chemical raw material by decomposition with lime, the primary products being

The mining and loading kryolith operations of Pennsylvania Salt in Greenland. Right, interior of a kryolith mine.





caustic soda, soda alum, and calcium fluoride. In 1864, King Christian IX granted a mining monopoly to the Danish Kryolith Corporation, and they in turn supplied the material to the chemical firm of Weber & Brothers of Copenhagen under whose auspices the researches of Thomsen had been conducted. The very year that these Danish agreements were signed, Mr. Lewis brought the matter of Kryolith to the attention of his fellow directors and proposed that Henry Pemberton, their plant manager, and his son, Samuel N. Lewis, be sent to Denmark commissioned to negotiate an exclusive American importing contract for this interesting material.

The following spring these agents went to Copenhagen, and after four months' investigation and negotiation, entered into an agreement with the Kryolith Corporation which has remained in force continuously to this day. The original contract called for a minimum annual importation of 6000 tons, and during the life of this agreement importations have several years exceeded four times this amount. As a result of securing this new raw material, the Pennsylvania Salt Manufacturing Company, in 1867, put on the market the first American-made bicarbonate of soda and from the same source has recently been able to commercialize modern discoveries in the use of fluoride insecticides.

In 1873 George T. Lewis resigned as a director and so terminated his active connection with the management of the Pennsylvania Salt Manufacturing Company. At the same time he turned over to the corporation, upon a favorable royalty basis, his famous brands of lye. These were widely and favorably known, for not only had he been a pioneer in the introduction of caustic soda in this field, but as a shrewd merchandiser he had improved on the solid cake by furnishing first the chip and later the powdered form, and he had developed not only the first tin can but improved the closure, first with a pouring spout and later with a sifter top.

It was preeminently a characteristic of George T. Lewis' business methods that he furnished the ideas and then called upon others to work out the details and to carry them forward to successful execution. An extremely successful merchant, he was no salesman; a great chemical enterpriser, he was neither chemist nor executive. His fertile brain was the dynamo that supplied the power which his associates and employees applied to useful, profitable purposes. His natural habit was to delegate authority and to place responsibility squarely upon the shoulders of his associates. His methods were successful, because he was a good judge of character and capability and also because of his own urbane temperament and sense of justice. He was genial, friendly, witty; and he had the gift of dealing with either his most dangerous competitor or his own office boy upon a personal basis without the loss of his own dignity or the jeopardy of their wholesome respect. He was too honest and honorable to be sharp. But he was keen and shrewd. He believed thoroughly that the first object of business is to make a good profit, and even today it is remembered in Philadelphia that he was without a peer in analyzing a cost sheet or a quarterly statement.

Like other distinguished and wealthy Philadelphians of his day, he bore an active part in the semi-public and charitable institutions of his city. His particular favorite was always the Church Home for Children, which he served faithfully as treasurer for more than a quarter of a century. During the Civil War, he helped to organize and equip the "Corn Exchange Regiment" (118th Pennsylvania Volunteers); and though he was never an office seeker, he long carried an important, unobtrusive part in civic affairs, where he was a power for good and honest government.

George T. Lewis died January 17, 1900, aged eighty-three, the sole survivor of incorporators of the Salt Company; his wife, Sally Fox Fisher, whom he had married May 18, 1843, and four of their five children surviving him. Sixty years previous, the obituary of his own father, published in the "National Gazette" of February 11, 1841, might well serve for himself: "Few men have passed their lives more usefully and less obtrusively . . . . Educated as a merchant, with the favorable principles which distinguished his ancestors, he soon became one of the brightest ornaments of our commercial circle. His unassuming nature did not permit him to be much before the public, although his talents, especially as an able accountant and skilled financier, ever impressed all with whom he was engaged in business."

Antimony Production 1934

Domestic antimony trade in 1934 was characterized by a marked upturn in prices and an apparent improvement in demand which was supplied in larger measure from domestic sources. Figures by the U. S. Bureau of Mines show that the increase in antimony prices was due largely to improved world demand, chiefly from Europe, supplemented in the closing weeks of the year by a strict control of Chinese shipments by the government sponsored monopoly.

There were notable changes in the sources of antimony supplied for domestic use in '34. Whereas, in the previous year there was an increase in supplies from all sources except antimonial lead, in '34 decreases were registered in all grades of imports except antimony ores and antimony-lead ingots, while supplies from domestic sources increased, with the exception of domestic ore production.

The mine production of antimony ores and concentrates in the United States in '34 amounted to 897 short tons, having an antimony content of 404 tons, decreases from 1933 of 20.8 and 31.2 per cent., respectively. The production of antimony oxides and other compounds in '34, from foreign ores and metal and from by-product treatment, was 5,137,956 pounds, an increase of 49.6 per cent. over the 1933 production of 3,435,332 pounds. The recovery of antimony from old alloys, scrap, and dross in '34 amounted to 7,550 short tons, an increase of 2.0 per cent. over the production of secondary antimony in 1933.

Fish and Animal Oils

as Chemical Raw Materials—Part II

OUT of a world production of fats and oils of between 18,000,000,000 and 24,000,000,000 pounds annually, the fish oils are a relatively small, but nevertheless, extremely important part of the total. In the United States for example, in the five-year period 1926-30, the average domestic production of fish oils amounted to 96,763,000 pounds and the total consumption of animal and vegetable oils, except butter, in the same period totalled 5,700,000,000 pounds.

Basic conditions governing the fish oils more closely parallel those prevailing in the animal fats than they do those controlling the vegetable oils. This is specially true as to availability of supplies. Almost unlimited expansion of acreage devoted to the vegetable oils is possible; increases in the supply of animal fats must necessarily be slow and may for extraneous causes fail to materialize. All of the commercially profitable sources of the various fish oils are known. Any increase could only be obtained at the expense of supplies in later years. Consumers would hesitate to switch from satisfactory vegetable or animal oils to fish oils. The vagaries of fishing results from season to season are definitely shown in the variations of production figures for the same oil over a ten year period.

Historical Significance of Whale Oil

Historically, whale oil ranks first in the fish oils group, yet it has dropped in the past seventy-five years from a position of prime industrial importance in many fields to one of relative insignificance with the major portion of the production consumed in a single industry. The price of whale oil is little affected by the price movements of the other oils and fats because all possible substitutions of other oils for whale have long since been made. The few uses remaining will continue indefinitely. Fear that the whale was slowly being exterminated was not without justification, considering the rate of consumption at that time. Based upon present needs no uneasiness need be felt, at least for many years to come. An additional guarantee is the agreement between the great majority of whalers to regulate the annual catch as compared to the ruthless competition of former years.

World Production of Whale Oil

(In Barrels)

1914	740,000	1924	723,475
1915	620,000	1925	1,044,272
1916	620,000	1926	1,166,857
1917	375,000	1927	1,220,425
1918	342,000	1928	1,362,008
1919	359,000	1929	1,865,330
1920	425,000	1930	2,797,513
1921	500,000	1931	3,689,631
1922	653,000	1932	896,750
1923	843,000	1933	2,551,906

Practically 99 per cent. of the whale oil consumed in the United States is first hydrogenated and then blended with other oils for use in soap, yet whale oil usually supplies but between two to four per cent. of the total consumption of fats and oils in the soap industry. In some years this percentage is even less. Whale oil in soap-making is technically interchangeable with tallow, greases, palm oil, and fish oil. Abroad, whale oil is used in the manufacture of margarine and possibly in lard compounds, but it has made no headway in these fields in this country. Even in the soap industry in the United States whale oil use is a restricted one. Consumption, approximating 50,000,000 pounds annually of which approximately 10,000,000 pounds is domestic production, is limited to the cheap soft soaps where odor is not an objectionable feature. The small balance of the total whale oil consumption is used mostly in agricultural and household sprays, and in the leather industry. Its use as a luminant is a thing of the past.

Menhaden Leads the Fish Oils

Menhaden oil furnishes the largest individual tonnage in the fish oil group, the supply of herring, sardine and salmon being considerab'y less. Production has at times been as low as 21,000,000 pounds and as high as

57,000,000 pounds annually. The largest single consumption of menhaden is in the paint and varnish industries. Very often the term "fish oil" when used by members of these industries is used to denote menhaden oil. In other cases the expression means nothing more than a mixture of fish oils.

Sources of Menhaden Oil

Menhaden fishing is carried on commercially in the waters off the Atlantic Coast, the season usually running from April to November. Processing for the production of the crude oil is done at factories where cooking and steaming of the catch is carried out as quickly as possible after the boat arrives in port. This prevents putrefaction with its consequent discoloration of the oil. The antiquated iron tanks or wooden vats have largely been superseded by modern continuous cookers of the direct steam type. Disagreement exists as to whether or not latitude and the distance from land where the fish are taken have something tangible to do with the character of the oil produced. No disagreement exists, however, on the urgent necessity of preventing deterioration. Color and acidity are important to the paint and varnish makers, and since the oil is used largely as a substitute for linseed or in combination with linseed to bring down manufacturing costs, the crude oil producers have of late years been giving particular attention to designing plants for quick processing. In the next step the crude oil moves to refineries, situated also along the Atlantic Coast, where it is treated and then offered in three grades: Light pressed, bleached or refined, and blown.

Fish Oils vs. Linseed In Paints

Fish oil dries more slowly than linseed and, therefore, more driers are necessary. When untreated menhaden oil is used in paint, and unless some means are employed to disguise the odor, the product is not suitable for indoor work. Fish or menhaden oil is not always simply used as an adulterant or for cheapening purposes. Used in metal paints, cement coatings, barn paints, roof paints, shingle stains and stack coatings it imparts definite and favorable qualities. Paints made with menhaden oil have a greater elasticity and, therefore, are more resistant to heat. Blown menhaden oil is used for the same purposes as blown linseed and possesses characteristics very like it.

Fish Oils in Soap-Making

Fairly large quantities of menhaden and also herring, sardine and salmon oils are used in soap-making, usually in place of or as a partial substitute for whale oil. The leather industry consumes fish oils and more particularly cod in the form of finishing and softening compounds, and some textile oils contain fish oils. As nearly all of these leather and textile finishing compounds are sold under trade-names and vary within wide limits in formula, oil consumption figures were difficult to obtain until the United States Tariff Commission undertook the task. In a report covering 83 producers of sulfonated and soluble oils and greases and softeners a consumption of 3,888,976 pounds of cod was reported for the year 1933 and 3,763,641 pounds for the year 1934.

Sources of Fish Oils

Sardine, herring and salmon oils are all by-products. Sardine oil from the pilchard is produced along the California coast. In normal years the production runs between 15,000,000 and 30,000,000 pounds. The amount of oil produced is limited by a state law which provides that only a portion of the entire catch may be used for the manufacture of oil. Herring oil comes from Alaska and Maine. In the East it is a by-product of the sardine fishing industry; in Alaska it is partly so and partly conducted as a primary operation from all kinds of small fish. The supply of herring oil is limited by certain requirements enforced by the Bureau of Fisheries. Salmon oil is likewise a by-product of the salmon canning industry. Production is relatively small, not over 2,000,000 pounds. Only a very small part of the actual waste has so far been used for oil production; were it all salvaged the total in an average year would reach about eight or nine million pounds.

Finally, cod-liver and certain other fish liver oils are highly prized for their vitamin D content and are used in large quantities for their food and medicinal properties.

Future Outlook In Fats and Oils

The fats and oils markets are constantly in a state of change. Keen competition exists for the same oil or fat in the edible and inedible markets; ruthless warfare is waged by the different fats and oils for the industrial markets. Now a common enemy is appearing ominously. The mineral oils have taken away many of the former markets of the animal fats and vegetable oils in the lubricating field. Now they are moving into the paint, varnish, leather and other fields as solvents or softeners displacing important animal and vegetable fats and oils. Demand for meat is not increasing at as fast a rate as the demand for animal fats. Will the renderer still continue to supply the difference? When will he meet the point of uneconomic operation? Will the vegetable oils or will mineral oils make up the deficiencies? Time, the unfolder of the future, will eventually give the right answers.

Non-Skidding Rubber Surfaces

Non-skidding rubber surfaces are said to result from incorporation of the rubber with 10 to 30 per cent. of hard granular particles (*e.g.*, quartz) previously coated with a viscous vehicle made up of glycerine and a heavy metal oxide. German Pat. 612,697 lists this process.

The Chemical Tourist Visits

WYANDOTTE

The City Built Upon Salt

Penn Salt's plant at Wyandotte, Michigan

By Williams Haynes

LOT'S wife ought to be the patron saint of Wyandotte, and I am surprised that the city fathers have not long since erected her image on the River Road opposite the Post Office. The Virginia town which has placed a great red apple on a pedestal in its public square has not raised a more fitting monument. The inquisitive lady who turned to salt ought to be quite as famous in Michigan as is the salted codfish in Massachusetts. She is every bit as symbolic.

Speaking of chemical raw materials the late John Teeple once said: "There are lime, sulfur, and salt; and the greatest of these is salt." Boldly carved on the base of the statue of Lot's wife, this might well serve doubly as Wyandotte's motto and credo. For here is a city literally and figuratively built upon salt.

Beneath it lay vast beds of solid rock salt. Upon these salt deposits have been built two great chemical plants, Michigan Alkali and Pennsylvania Salt, and clustered about them are half a dozen other chemical operations. This chemical group is the industrial nucleus about which the city has grown.

All the great salt deposits of the northeastern quarter of the United States—Syracuse, Ohio Valley, Kanawha, Michigan—are of the same geological lineage. Successively moving westward all have been exploited by the deer and the redmen, by the pioneers, and later commercially for table salt, and finally industrially as a chemical raw material. It was only after the Civil War that the Michigan salines reached the stage of commercial working for table and packing purposes; but because of their extent and purity they were not long in driving the Ohio and Kanawha Valleys' salt works out of the Middle West markets. It was just forty years ago, with the building of the first plant of the Michigan Alkali Works, that they entered upon their modern chemical era.

Today the city of Wyandotte, with a population of 28,000, stretches along the Detroit River for five miles, a busy, depression-proof community where trim, modern stores and block after block of well-kept, attractive homes bear evidence of the importance of this chemical center. If you drive out from Detroit, as I did, and traverse the full length of Wyandotte, you reach at the end a new plant, the youngest of the Wyandotte chemical enterprises. It makes a capital beginning for a chemical tour of this salt-based city.

Sharples Solvents moved to Wyandotte from Belle, W. Va., two years ago—in March, 1933, to be exact—into a new, specially designed plant for which ground had been broken the previous autumn. With ten years' practical operating experience, their plant is not only a model of modern layout, construction, and equipment; but it is also an example of chemical expansion during the depression. Moreover, the entire Sharples process and location make a striking demonstration of the chemico-economic principles of interlocking raw materials.

Away back in the dim and distant pre-war days, neither the 'know how' of producing lacquers nor a proper appreciation of the usefulness of these coatings was lacking. There was, however, a definite lack of suitable solvents and proper plasticizers. The only known plasticizer was camphor, a cherished and very smartly exploited natural monopoly of the Japanese, which was comparatively costly and not wholly satisfactory. The best available solvent was amyl alcohol; but being recovered as a by-product in the distillation of alcohol, its supply was sharply limited. Even after other lacquer solvents became available in virtually unlimited quantities, the inherent merits of amyl alcohol made it very much worth while to increase the supply by synthesis. Upon this commercial opportunity and a neat process in which chlorinated pentane is hydrolyzed to amyl alcohol has been built the Sharples Solvents Corporation.

Their raw materials are pentane, chlorine, and caustic soda. The two latter and steam they take in from their neighbor, the Pennsylvania Salt Manufacturing Company, to whom they return certain of their by-products. It was this exchange of raw materials and by-products that provided the working basis of the

Photograph shows the stills and scrubbing tower, part of the equipment installed in the small scale unit at the Sharples Solvents' plant in Wyandotte.

agreement by which they bought land from Penn Salt. But advantageous location with respect to customers was not overlooked either. The chief market for their solvents and newer plasticizers is in modern coatings, and Wyandotte is but a stone's throw from Detroit and between Cleveland and Chicago.

At the head of this modern plant with its modern line of products is one of those personable and energetic young chemical engineers the industry's management is so fond of putting in charge of its newer operations. He is slim and trim, brown hair and brown eyes, quick in his movements, decisive in his speech. Everybody in Wyandotte knows Lee Clark and everybody likes him. He came up from Belle when the Sharples plant was building and from the first rough sketch to the new plant-scale experimental unit, he knows every bolt in the structure, every screw in its apparatus. He knows, too, every ounce of pressure and every degree of temperature in each stage of their rapidly growing processes, and like his contemporaries of the younger generation of plant executives, he knows where all his products go and why, down to details of sales contracts and the first names of the men the salesman has sold and the man to whom he ships.

"We make six of the seven possible amyl alcohols," he told me with well founded pride, "and can serve them straight or mixed as you like them. We sell them chiefly mixed, though there is a small but growing market for several of the separate isomers. So you can see we are cutting pretty fine in our new fractional distillation plant. We have amyl acetate and the amyl amines, tertiary amyl phenol, and amyl mercaptan.

"We rather fancy some of the possibilities in the phenol group which we had in the experimental stage at Belle, put into commercial production here, and have already expanded. That mercaptan is the prize inverted perfume, and it is used at the modest rate of 7/10 of a pound to a million cubic feet of natural gas so that leaks may be readily detected. It is so efficient that a farmer, through whose land a pipe-line was laid, reported that a skunk must have crawled into the pipe and died!

"We are heading towards other amyl compounds and working on the chlorination of several new materials. The amyl phenols lead to oil soluble phenolic resins and the amyl amines as emulsifying agents and in the preparation of dyestuffs and intermediates. Our patents on the Sharples chlorination process do not restrict us to the pentanes, and we have some enticing experiments with a variety of unusual raw materials that yield some curious and promising chlorination products."

We went off to lunch to the Wabeck Tea Room, with R. H. Samis, the plant superintendent, Lee Clark's younger brother, Bruce Hainsworth, chemical engineer, and H. A. Bohall, the chief chemist; and a jolly lunch party it was with many reminiscences of mutual friends in the Kanawha Valley. Afterwards, they escorted me back to the Pennsylvania Salt Manufacturing Company into the big square office of William LeBar, who is a lean, dark, business-like chap, a capital captain for this mother ship and her convoy of allied chemical enterprises. For Penn Salt has built up around its own great electrolytic alkali plant a community of chemical interests, not only the new Sharples plant but also another chlorinating enterprise, a hydrogenation operation, and an outlet for oxygen. The first of these "chemical tenants" is the Bakelite subsidiary, Halowax, run by the energetic Mauritho brothers, O. L. and R. R., and producing synthetic waxes by the chlorination of naphthalene. The Wyandotte Oil & Fat Company is making lubricants by hydrogenation, while the Michigan Oxygen Sales Company, with Fred. W. Wirth at the head, supplies oxygen for welding to the motor car factories of the Detroit District.

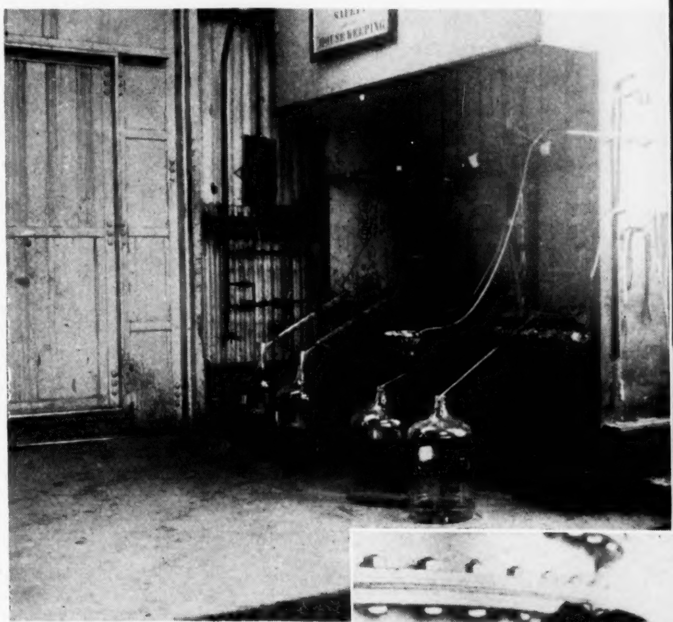
The mother plant of this interesting group dates back to 1898, when the Pennsylvania Salt Manufacturing Company, carrying through their consistent program of expanding the chemical utilization of salt brine, purchased 130 acres, overlying enormous salt beds. They built an electrolytic plant which has grown to the largest operation of this process in the Middle West. Then and now an important part of the plant operation is the packing of lye, produced from caustic soda; and a great, clanking battery of can filling machinery, with its accessory of automatic labelling machines, introduces a novelty into an alkali operation. Mr. LeBar spoke quietly of millions of cans and added that he 'dared say more cars of packaged lye were loaded from this platform than anywhere else in the world'. While it would seem that housewives would no longer continue

to turn their fat scraps into home-made soap, this practice still consumes vast quantities of lye, and other new uses that have been added result in the innumerable number of cans filled, labelled, and boxed that I saw that afternoon.

But lye, while the most basic product, is no longer most important either in pounds or in dollars. The chlorine is put to work in a whole series of processes, resulting in muriatic acid, bleaching powder (including the high test specialty Perchloron), carbon tetrachloride, ferric chloride, including both the liquid and the newer anhydrous forms. Nor has the ultimate chlorine utilization been reached, and there is promising research under way for new standard and specialty products, in the fields of metallic chlorides and chlorinated organics.

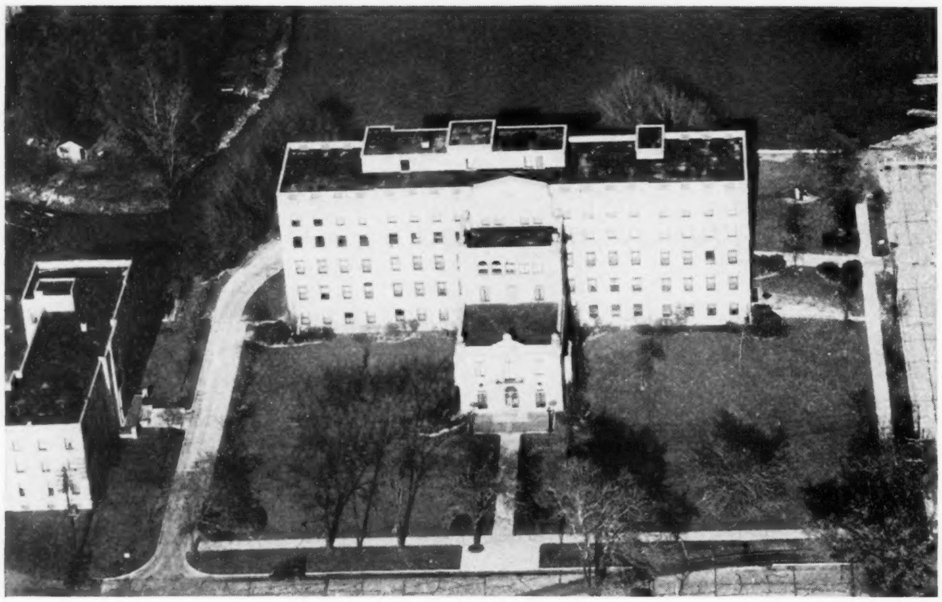
Housed in a separate building is the low pressure ammonia plant, in which is produced not only ammonia, which consumes the hydrogen gas from the alkali-chlorine cells, but the surplus oxygen supplied to the tenants. (All this is a post-war development, an offsetting operation to the declining production of bleaching powder.)

At the giant plant of the Michigan Alkali Works there has been a paralleled development in another big new building, where excess CO_2 from the lime kilns is compressed to the solid form in blocks, ten inches square, weighing about 55 pounds each. For five years this has been an important and growing section of this oldest Wyandotte plant. I was vividly impressed with this fact one evening last week when on lower Tenth Avenue in New York my little roadster met an enormous truck coming round the end of a stalled freight train. As I jammed down the brakes I looked up at the mountainous van above and read in billboard-sized letters "Dry Ice—Michigan Alkali Co." The driver and I grinned at each other sheepishly, and suddenly



Above, left, corner in Sharples Solvents' laboratory at Wyandotte, showing experimental runs on new solvents. Constant experimentation is going on in the development of both new solvents for industry and new uses for existing solvents.

Above, right, Lee Clark, vice-president in charge of production at the Sharples plant, and, center, R. H. Samis, plant superintendent.

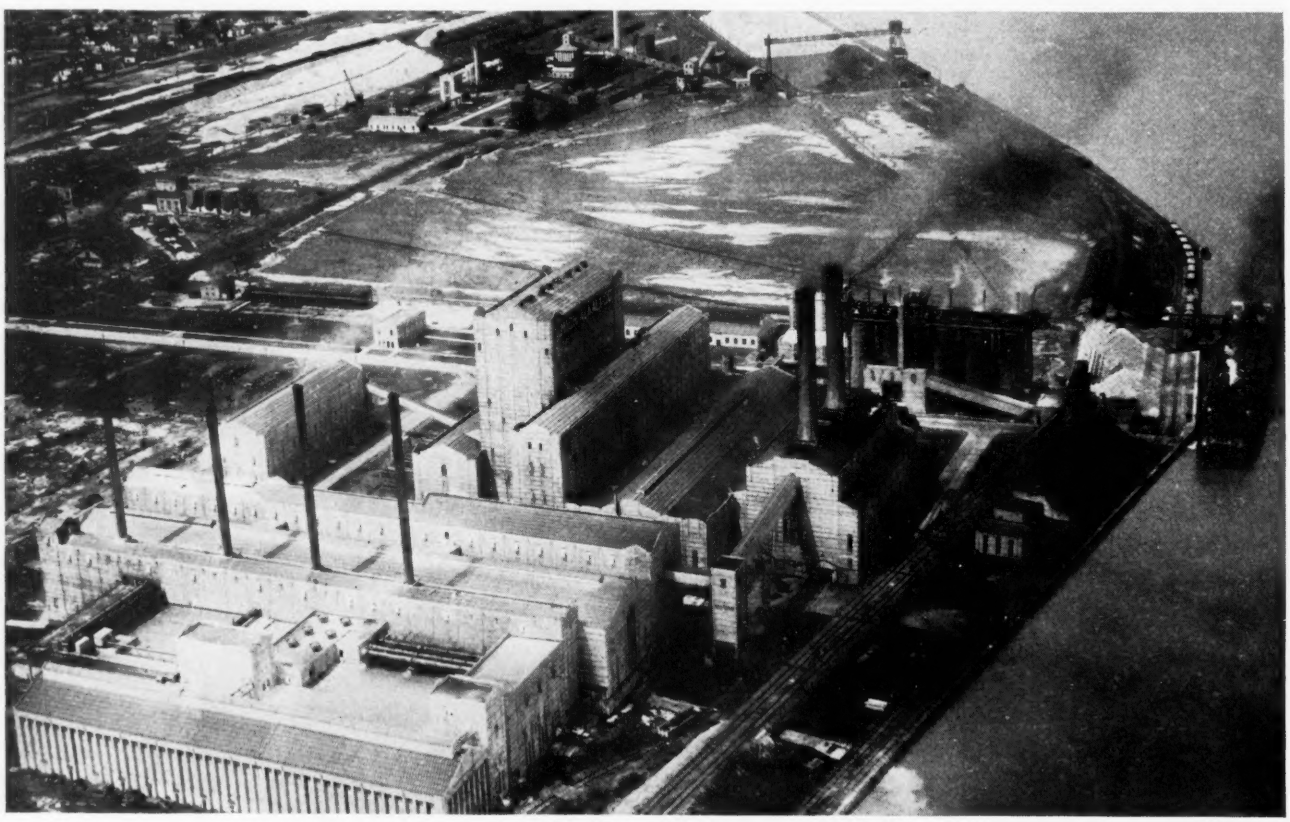


The Wyandotte General Hospital endowed by the Ford family about five years ago.

to his amazement I burst out laughing. I had thought of the beautiful obituary notice we should have had in all the chemical press.

But all this is far from Wyandotte, and to write the chemical story of Wyandotte without Michigan Alkali would be like cutting the part of the melancholy Dane out of "Hamlet". It was fortunate, therefore, that in a quiet, blue and mahogany office in Detroit I obtained a special dispensation to tour the pioneer chemical enterprise of this chemical community. "Inquiring reporters" of whatever ilk are not very welcome in anybody's alkali plant; but having made me an exception the rule was evidently to do so thoroughly and cordially. The president's own secretary, a most courteous young Atlantan, introduced me at both units of the plant and carried me off to lunch at the Wabeck (which is a Wyandotte Indian word that probably does not mean "Chemists' Club," but ought to). I visited the South Plant, escorted by the Superintendent, Milton S. Moore, in the forenoon, and after lunch the newer North Plant, guided by its Superintendent, Francis B. Griffith.

This is serving the best wine last with a vengeance, for while the older plant is a very considerable alkali factory, with the new CO_2 plant as added attraction,



Air view of Michigan Alkali North Plant at Wyandotte.

the North Plant alone is the most modern and the largest single soda-ammonia operation in the world. It is almost as much a Michigan Alkali product as the ash and bicarb it turns out by the tons daily, for it was planned by their own engineers, built of their own cement, with the piping, kilns and what not built in their own foundry. In fact, save for the motors, the copper stills, and the light-fixtures and wiring, the whole titanic chemical city was home-made. As it stands on 12,000 fifty-foot piles driven down to bedrock and consumed 10,000 tons of steel and half a million bags of cement with 42 miles of piping within and without, you can see that it was quite a little bit of homework.

This impressive example of self-sufficiency was not inspired by pride, or distrust, or economy. It is of the web and woof of company policy. The Michigan Alkali consumes coal and lime and salt. The two plants stand on a plot of nearly 300 acres under each one of which is roughly 10,880,000 cubic feet of salt; reserves sufficient for the next century and a half. At Alpena, Michigan, the company owns their own quarries from which, for their own cement and chemical plants and to a few big customers, they are shipping two million tons of highest grade chemical lime a year. At this rate of output their reserves are good for sixty years. Furthermore, the company owns three Pennsylvania coal mines on the Bessemer road, a short haul to the lakeport of Conneaut. This coal from Lake Erie and lime from the Lake Huron quarries are brought in their own boats to their own docks on the Detroit River.

These great stock piles of coal and lime, black and white mountains, are one of the impressive sights one carries away from a visit to Wyandotte. Great as they are, they are dwarfed by the massive plant buildings behind them. The tallest is as high as a twenty-one story office building; the smallest looks like some vast storage warehouse. As a group they stand a landmark for miles around. Here stands, they proclaim, the city built upon rock salt.

Origin and Processing of Gum Arabic

Gum Arabic is the gummy exudation of *Acacia Verek*, one of the 400 or more known species of the *Acacia* family of which about twenty-five are found in the Sudan. It has been known and used in the making of paint colors, since 2000 B. C. As an article of commerce in the first century A. D., it was shipped to Arabian ports and thence to Europe, thus receiving the name, Gum Arabic.

The *Acacias* are the chief constituent of the thorn forest of the Arid Zone, a belt stretching across Africa from Abyssinia in the east to French Senegal in the west and chiefly between 12° and 13° Latitude. The best gum and the large majority of the crop comes from the province of Kordofan, and large quantities come from Gedaref, Gezireh and Gallabat, though this is not of such good quality. Gum Senegal also is shipped from the French Senegal and is very similar.

The trees grow to a height of from 12 to 15 feet in the Sudan, have a light gray bark and small feathery foliage with dark hooked thorns. Being a leguminous tree it is used much by the Arabs in the reclamation of waste land worn out by excessive cultivation. It is not raised much from seed but propagated by natural regeneration. The life of the tree is about 25 years, after which it usually succumbs to the attacks of various insects and is finally destroyed by white ants.

The gum picking season begins after the rains are over, continuing until the beginning of the next rainy season, or approximately from October to May or June. The total rainfall governs in a great measure the size of the crop; after a season of heavy rain the crop will be small, and vice versa. The time of starting tapping is governed to a great extent by the temperature following the rains; if hot, the leaves will wilt and fall and the season will start.

The tapping is done as follows: The native will cut off with his axe the lower branches of the trees to get access to them. Then he nicks the tree with his axe, taking care to cut just under the bark and not into the wood. He next lifts the edges of the nick and pulls one up and the other down the tree until they break off. If the weather is hot the gum starts exuding and in about three weeks to a month there is sufficient gum to collect. If the weather is cold, a much longer time will elapse. The gum does not exude all along the wound, but only in spots and forms the tears which are crystallized by the heat. When there is sufficient gum, the native starts collecting, and goes out at an interval of a week or so until the season ends.

Marketing the Gum

Formerly, the sale of the gum in the market was a very crude proceeding, the buyer often using his leg which he said weighed so much as the weight in one of the pans of his scales. Since 1922 however, the government has supervised the auctioning of the gum in all the markets. The method described by the Gum Department of Jacques Wolf & Company, is as follows:

When the Arab arrives at the market he is given a ticket with the number of the lot in which he is to place his gum. A record is also made on a form of the number of the lot and the Arab's name. Every bag in each lot is then opened and the merchants examine all the day's offerings. At a certain time the gates of the market are closed and a government clerk opens the auction starting with lot #1 and so on. When bidding has ceased the owner of the lot is asked if he will sell at that price. If so, the price is entered on his ticket and the form filled out. At the end of the auction the gum is transferred from the Arabs' skins to the merchant's sacks and weighed by the government clerk in the presence of both buyer and seller and the calculation made. The buyer then must pay the seller. The auction seldom takes more than an hour and everyone is satisfied whereas under the old system sales sometimes took all day.

After the weighing the merchant takes it to his own sheds, where it is cleaned, usually by pilgrims on their way to Mecca, and then put in double sacks and sent by railway to Port Sudan and thence to the markets of the world.

Gum is only obtained from the trees when they are in an unhealthy condition. A healthy tree growing in a spot near water or on well fertilized ground will remain in leaf almost all year. If tapped, the wound quickly heals and no infection occurs. The gum is the result of a bacterial infection of the wound which only takes effect when the tree is unhealthy. The method by which the infection is introduced seems to be a matter of varied opinion among authorities, some holding it to be from flies and ants which seem to swarm over the new wound, others advancing other theories.

Gum Arabic has a number of well known uses, some of which are pharmaceutical, confectionery, textiles, (both as a finishing agent and in printing) as an adhesive, making of syrups, purifying of liquors, sizing, lithography, and manufacture of matches. The total consumption amounts to 15,000 to 20,000 tons per year, of which the U. S. A. uses at least one-fourth.

Depreciation of Equipment

By James Kunst

WEBSTER defines depreciation: "A fall of value: of money, a reduction or loss in exchange value or purchasing power, especially with reference to the face value. A lowering in estimation; disparagement." This popular definition was too all-inclusive for technical usage, so accountants limited the definition to the following: "Depreciation is the decline in cost value of fixed assets caused by wear and tear, inadequacy and obsolescence."

This definition was satisfactory until the recent fluctuations in the purchasing power of money. Then appraisers and public-utility rate experts developed the thought that depreciation should include the amortization of appreciation. At present, a difference of opinion exists as to whether depreciation is the amortization of the cost value, the reproduction new value, or the present market value of fixed assets. There is also variance of opinion as to whether the sum amortized is a reservation of profits, a sum of money, a provision for the replacement of fixed assets, a decline in exchange value, a decline in efficiency, a financial loss or an operating cost. Esquerre (Accounting) aptly says: "Depreciation is as difficult to define as its process is difficult to perceive."

The clearest-cut definition broad enough to be acceptable to most professional depreciationists, seems to be: "Depreciation is the cost element caused by the decline in the number of useful service units in property." The exact meaning, however, can best be seen by differentiating depreciation from terms closely associated with it in common parlance.

Depreciation is not reservation of profits. The idea that depreciation is something taken out of profits is not only misleading but dangerous. Published corporate reports and prospectuses are full of this misconception of depreciation. Playing upon the loose ideas concerning depreciation in the minds of the public, a company (capital stock $100,000, annual depreciation $25,000, profits before deducting depreciation $40,000) will announce a net profit of $40,000, available for depreciation and dividends. This half-truth makes the company appear to be earning 40 per cent. when it really is making only 15 per cent. Or the same company (assumes $20,000 prospective issue of 5 per cent. bonds) will announce that the net earnings available for interest on bonds and depreciation have been 4.0 times the interest on this bond issue. This half-truth conceals the fact that the true net profits were only 1.5 times the interest charges.

Depreciation is not sum of money. Association of depreciation with the replacement of the depreciated assets has sometimes caused depreciation to be spoken of as a replacement fund. This is absolutely incorrect because depreciation is the cost of service rendered, an expense rather than an asset. Depreciation exists whether or not cash is set aside to replace the asset when scrapped.

Depreciation is not provision for replacement. True, depreciation is one of the causes of replacement, but depreciation is a cost of operation entirely independent of the owners' financial policy regarding replacements. The owners of a plant building suffer by depreciation even though they do not intend to replace it when no longer usable. Few producers want their plants exactly replaced, but all amortize their present equipment.

Depreciation is the amortization of present property, not an acquisition of future property. Whether the future property will cost more or less than the cost or present value of the present property does not necessarily effect the depreciation of the present property. Suppose that an asset was purchased in a period of constantly rising prices (cost 100, present value 120, a replacement cost 135). It is open to question whether the annual depreciation charges should be based on the cost or present value, but it is illogical to use the replacement cost as the base. The decline in the number of service units in present chemical equipment cannot be valued in terms of the cost of buying future apparatus. To amortize equipment at its replacement value can be logically defended only if the replacement value coincides with either the cost value or the present value. It is unfortunate that the advocates of basing depreciation on a valuation other than original cost do not speak of present reproduction (appraised) values instead of replacement costs. In misstating their basis they greatly weaken their position.

Depreciation is not financial loss. The charge for depreciation is made because of service rendered by the property and not because of any financial policy. The charge for depreciation is, therefore, not a financial loss but is part of the overhead of the department in which the service is rendered.

Depreciation is not decline inefficiency. The difference is seen in the case of the famous "one-hoss shay" which maintained its efficiency but not the number of its prospective service units right up to its calamitous end. Depreciation is the decline in the number of useful service units; efficiency is the relative excellence of the performance of these service units. This distinction is vitally important, because many producers believe that adequate repair programs which maintain the efficiency of their plants enable them to ignore depreciation. It is well to remember Hatfield's (Ac-

counting) apt words: "All machinery is on an irresistible march to the junk heap, and its progress, while it may be delayed, cannot be prevented by repairs."

Depreciation is not a decline in exchange value. To speak of depreciation as "shrinkage in value due to wear and tear, etc." is unfortunate because appreciation more than equals depreciation. No one denies that the Hudson River is flowing to the ocean simply because at high tide more water is coming into the river bed than is going out of it. Similarly, no one can deny that a machine is marching to the junk heap simply because the vagaries of price levels may have caused a net rise in its market value. The result of the high tide is to increase the flow at ebb tide; the result of the appreciation is to increase the diminution of value in the subsequent periods.

Depreciation cannot be offset by appreciation because (a) depreciation is an operating cost and appreciation is an unrealized profit and (b) depreciation is a deduction for tax purposes and appreciation is not a taxable income.

Depreciation is not deterioration. Depreciation, a financial result, must not be confused with deterioration, a physical condition. Deterioration is only one of the causes of the loss of service life or depreciation.

Depreciation is not obsolescence. Depreciation, the financial result of the decline in the number of useful service units in property, is not synonymous with obsolescence, an economic process which causes depreciation by attacking the utility of the remaining service units in property. The classic example of obsolescence was the supplanting of the horse-cars by the power-driven street cars. Obsolescence does not cause loss of service life from the physical but from an economic point of view.

Defining Inadequacy and Depletion

Depreciation is not inadequacy. Inadequacy is an economic process which attacks the utility of the service units in property. The economic process, inadequacy, is one of the causes of the financial effect, depreciation. The most frequently seen examples of inadequacy are the supersessions of small water and gas mains by larger mains in rapidly growing urban communities. Inadequacy does not physically affect the mains but renders it an engineering economy to replace them.

Depreciation is not depletion. Depletion is the physical diminution of property and reduces the physical life of property, while depreciation shortens the service life. The word depletion should be limited in accounting terminology to exhaustion to the extractive industries, oil and gas wells, timber trade and mines. Depletion through the exhaustion of the natural wealth may be cause of depreciation of equipment used in the extracting process.

Physical depreciation is the cost element caused by deterioration. Deterioration causes depreciation by physically reducing the number of service units in property. The chief causes of physical depreciation are wear and tear from operation, action of time and of the elements, accidents, parasites, pollution of water, corrosion, electrolysis and crystallization.

Functional depreciation is the cost element caused by obsolescence, inadequacy and depletion. Functional depreciation is the reduction in the utility rather than the actual number of the service units in property. In the case of obsolescence, the utility is lessened by a new development whereby either the thing produced or the process or production is changed. In the case of inadequacy, the utility is lessened by a change in the demand made upon the property due either to consideration of engineering economy, or unforeseen developments, or abandonment of original financial policy. In the case of depletion, the utility is lessened by the exhaustion of the raw materials upon which the depreciating property was designed to perform its functions.

Distinction Between Contingent and Predictable Depreciation

Due to the accounting necessity of recording depreciation as a charge against current operations, a distinction must be made between depreciation that can be foreseen and depreciation that cannot be foreseen. Drawing the distinction between contingent and predictable depreciation involves the use of the law of averages. For instance, a telephone company knows that during a normal winter the weight of snow and sleet will break down some of its poles. A reasonable estimate of such destruction should be included in the depreciation charge, but provision of the widespread destruction occasioned by an exceptionally severe sleet storm should be made directly from the surplus account and not through the depreciation charge. Similarly, the chemical industry must expect a considerable loss due to obsolescence. This predictable loss can be included in the depreciation charge, but any additional provision for contingent depreciation should be made directly to the surplus account.

Actual (also called absolute) depreciation is a term sometimes used to denote the decrease in the sales value of a fixed asset from its condition new to its present value. If the asset is ready for the scrap heap, the actual depreciation would equal the total theoretical depreciation. The actual depreciation is not applicable to going-concern valuations where the supposition is that the asset will be used during its service life and not sold. Theoretical depreciation is the equitable amortization of the total cost element caused by the decline in the number of service units in property over the service life of the property.

Under ordinary conditions, depreciation in going concerns should amortize the cost less the scrap value of the fixed assets. Should the facilities have been procured at abnormal costs, they should be appraised. Obviously, either fixed assets valued at the high construction costs that prevailed during boom times, or fixed assets valued at purchase prices found in "forced" sales in bankruptcy proceedings prevent a balance-sheet from reflecting the true worth of the concern. Fluctua-

tions in the appraised value of fixed assets occurring after purchase may be recorded only if the changes were sufficient to warrant a formal appraisal being made. The amount to be amortized through the reserve-for-depreciation account may, therefore, be either cost value less scrap value or appraised value less scrap value.

Given the right conditions, amortized appreciation may be properly called a cost element. Assume a plant building which has appreciated. If the concern continues to use the building instead of selling it and moving to cheaper quarters because of reasons concerned only with the manufacturing processes, the amortized appreciation may, from a theoretical point of view, be properly classed among the cost elements. Usually amortized appreciation should be excluded as a cost element on the general grounds of expediency. The specific reasons for the exclusion are:

1. The reasons for the continued use of an appreciated asset are frequently complicated. These reasons are: (a) Difficulty of finding purchasers at appraised value; (b) cost of moving, and (c) advantage of present location from the view-points of sales, supply of labor, supply of material, transportation facilities, power, etc. Only a just portion of the amortized appreciation can be deemed a cost element in such cases.

2. Including amortized appreciation as a cost element increases the difficulty of valuing the inventories of work in process, component parts and finished goods. The amortized appreciation charged to unfinished factory orders and to unsold product must be computed and deducted from the final inventories or it will be anticipated. The technique involved is practically identical with the handling of the "interest on investment" cost element included in the final inventories.

The Right Plasticizer

By J. T. Morris

Superintendent, Franco-American Chemical Works

It is apparent from various editorial comments that some chemical manufacturers harboring unrequisitioned high boilers visualize a use for the same as a lacquer plasticizer. Because any viscous, inert, high boiling solvent, practically non-drying, neutral, and odorless, has plasticizing properties is no guarantee it will be ideal for use in complex lacquer formulations. Oily solvents, such as Tricresyl Phosphate, Dibutyl Phthalate, etc., have more in their chemical make-up than strikes the casual eye; they are ester radicals, ideally adaptable in present-day lacquers.

The non-drying constituents of fly paper and adhesives would have poor plasticizing power to impart in motor car finishes. Still at further variance are the plastifying agents used in resin finishes and waterproofing compositions. The difference between elasticity and plasticity is apparently misconstrued. Latex will expand many times its original dimension mechanically but upon release of strain immediately assumes its former size; but the same results are not evident when you stretch a piece of chewing gum, the answer being that rubber is elastic whereas a gum is plastic.

Investigation of a plasticizer adaptable for nitrocellulose, cellulose acetate lacquers, requires that the test be conducted on both clear and pigmented finishes to ascertain what amounts can be tolerated. What experimental cut and try must determine is whether or not the plasticizer is compatible, flexible, has tensile strength, durability, volatility, and adhesion. Will it air dry? Has it stability under light, under varying temperatures, and atmospheric conditions? Furthermore, it invariably needs to be a solvent for the solids it is to plasticize, must be free from decomposition and resultant discoloration, have definite degrees of retentivity in the finished film, with pronouncedly strong plastic action. All of these qualities and many more are requisite when finishes are applied to rubber, textiles, wood, metal, glass and pottery, while last but not least there is a price inducement.

It might not be amiss to call attention to the many high melting point solvent compounds offered for these purposes, and to point out that solid plasticizers must not crystallize in the finished coating, thereby weakening it. Whether or not it will be water soluble in its crystalline state, or be subject to oxidation and hydrolysis, must also be given consideration. The ideal plasticizer is, as yet, said to be a nebulous futurity, nevertheless the twentieth century lacquer technician with approximately 48 plasticizers, none of which are all-purpose in scope, has adapted the materials at hand with excellent and striking results.

Industry's Bookshelf

Spanish Influence on the Progress of Medical Science, 121 pp. The Wellcome Foundation Ltd., London, Eng.

Commemorating the 10th International Congress of the history of medicine, held at Madrid, Spain, this year, this beautifully bound little history will delight those interested in medical progress through the ages. Included is an account of the Wellcome Research Institution, its history, progress and its work.

Introduction to Inorganic Chemistry, by G. H. Cartledge, 594 pp. Ginn & Co., $3.00.

Concentrating immediately upon the atomic conception, Mr. Cartledge develops his text from what he believes is the beginning. From chemical change to electrode potential, atom chemistry is emphasized. The author believes this teaching method will prove more effective than previously followed inductive systems.

Inorganic Preparations, by William Edwards Henderson and W. Conrad Fernelius, 177 pp. McGraw-Hill. $2.50.

Selected preparations designed to illustrate principles of chemistry should be of invaluable aid to the inorganic chemist planning to do graduate research work. Though not a recipe book, volume will be a valuable addition to the company library.

Unit Outlines in Chemistry, by Theodore Colen and Barclay M. Newman. Supervised by Gustav L. Fletcher and Myron H. Glover, 220 pp. College Entrance Book Company.

Designed to supplement the average textbook, this condensed outline presents fundamentals simply, numerically, and concisely. Actual high school examinations are included at back of volume.

Organic Solvents: Physical Constants and Methods of Purification, by Arnold Weissberger and Erich Proskauer. Translated by Randall G. A. New, 210 pp. Oxford University Press. $5.00.

Remarkably complete as a compilation of once disorganized data, this volume will be of great service to organic chemists in any field. Primarily a handbook, the text is organized for clarity and ease of use. Dr. New's translation represents a valuable addition to this growing field.

Points for Pyrethrum Buyers Learned by Pyrethrum Growers

By R. E. Culbertson

Research Fellow, Crop Protection Institute

Experiments on the growing of pyrethrum in the United States have developed new facts on the comparative toxicity of open and closed flowers, age of flowers, etc., which upset some cherished trade beliefs and are very suggestive to the buyers of this most broadly useful of all insecticides.

EIGHT years of experimental work by the author with pyrethrum on several hundred plots in 24 states shows conclusively that pyrethrum can be grown successfully in the United States. In the areas suitably located, the plants hold up and yield well, and the flowers are as high, and, in many instances, higher in toxicity than those imported. From the viewpoint of the insecticide manufacturer using pyrethrum, information of value has been developed.

Pyrethrum is the name commonly applied to *Chrysanthemum cinerariaefolium* (Trev.), the flower of which resembles the common field daisy. It is the chief source of pyrethrum sprays, dusts and powder and owes its superiority to *Chrysanthemum roseum* and *carneum* in that it yields more flowers and the bloom occurs concurrently. Growing *roseum* and *carneum* for insecticidal purposes is impractical and as the importation of these species is negligible, it is time to stop listing them as a source of pyrethrum in the commercial sense.

A full report on the pyrethrum fellowship here would be too voluminous and tiresome. However, a brief history of the work and the findings are in order.

During the summer of 1927, Stanco, Inc., wishing to insure a domestic supply of pyrethrum and foster its commercial culture in the United States, established a fellowship with The Crop Protection Institute, beginning September 15, 1927. The author was selected to carry on the investigations and an advisory committee consisting of Dr. T. J. Headlee, State Entomologist of New Jersey, Chairman; Dr. W. E. Britton, State Entomologist of Connecticut; and Prof. W. C. O'Kane, State Entomologist of New Hampshire, was appointed. As a preliminary investigation, a report on pyrethrum was prepared from over 700 references gleaned from all over the world.

In February, 1928, through the courtesy of Wilmon Newell, Director of the Florida Agricultural Experiment Station, a base was established at the University of Florida. This site was selected because, 1. of its similarity in climate to parts of Japan and the Mediterranean countries; 2. plants could be raised throughout the year and sent to trial locations; and 3. labor was plentiful at low cost. A four-acre planting was established at Gainesville Experiment Station grounds and plots set out at Sanford, Ocala, Lake Alfred, Barto, Quincy, Penny Farms, Brooksville, and Baldwin, Fla.

During 1928-29 trials were also begun at Tifton, Ga.; Auburn and Montgomery, Ala.; Knoxville and Limestone, Tenn.; Blacksburg, Olney and Brookneal, Va.; Raleigh, Willard and Rowanna, N. C.; College Station, Beeville, Westlaco, Temple, Lubbock, Iowa Park, Denton, Balmorhea and San Antonio, Tex.; State College, Lancaster, York and Somerset Counties, Pa.; Clemson, S. C.; Williamstown, Glassboro, and Roselle, N. J.; Wooster and Mentor, Ohio; New London, Conn.; Lafayette and Valparaiso, Ind.; and Lexington, Ky.; whenever possible, under the supervision of experiment station workers. The areas (with the exception of Texas) were inspected several times yearly and comparisons made in respect to growth, freedom from disease, longevity, etc.

Space does not permit the publication here of all the results, but it soon became apparent that pyrethrum behaves as an annual in the extreme south, as a biennial a little farther north, and, in general, as a perennial lasting at least for 7 years (by subsequent observations 1928-35) within favorable growing areas between 37 and 50 degrees N. latitude, allowance being made for differences in elevation.

Wishing to locate further north—a new base was established in September, 1929, at the University of Kentucky. Here the author was appointed an assistant in agronomy and ably advised in the plot work by Professors Roberts, Kinny and Olney; in plant chemistry by Professors McHargue and Emmert; in entomology

Table 1

Location	*Elevation*	*Latitude*	*Rain-fall*	*Soil*	*pH*	*Total Pyrethrines*
Lexington, Ky.	989	38	48	Trenton limestone	5.8	.42-.75
Knoxville, Tenn.	996	36	48	Dolomitic silt loam	6.0	.47-.59
Norfolk, Va.	91	37	46	Sandy loam	5.9	.44-.78
Raleigh, N. C.	390	34	46	Cecil clay loam	6.3	.45-.84
Gainesville, Fla.	14	30	48	Norfolk sandy loam	5.4	.42-.60
Williamstown, N. J.	130	39	44	Norfolk sandy loam	6.5	.47-.76
Ithaca, N. Y.	928	42	32	Stony clay loam	6.6	.47-.61
Valparaiso, Ind.	805	41	32	Fine sandy loam	7.2	.54-.76
Fort Collins, Col.	4985	40	14	Clay loam-irrig.	7.0	.54
Lancaster, Pa.	255	40	40	Limestone and shale	7.0	.41-.82
E. Lansing, Mich.	863	42	40	Sandy loam	5.9	.43-.54
Wooster, O.	1030	40	39	Silt loam	6.0	.47-.69

by Professor Price; and in plant-disease studies by Dr. Valleau. A great deal of the experimental work was done at Kentucky. During 1929-30, plantings were established at Fort Collins, Colo.; Ithaca and Geneva, N. Y.; Westminster and Sykesville, Md.; East Lansing, Mich.; Urbana, Ill.; Morgantown, W. Va.; Manhattan, Kan.; Brookings, S. Dak.; Lafayette, Ind.; Lincoln and Alma, Neb.; Worcester, Mass.; and in 1931, commercial plantings were started in several counties in Pennsylvania.

In the spring of 1932, a privately operated Pyrethrum Experimental Farm was established at Belleville, Pa., and the work is now being fostered under The Crop Protection Institute from this location. Here selections are being made and superior strains propagated, tests made with fertilizers relative to their effects on toxicity and yield, experiments with mechanical harvesting conducted, and 300-500 pounds of seed raised annually. Commercial production in Pennsylvania and several other states is being encouraged and anyone interested is supplied with printed instructions (free) and seed at a very nominal cost.

Considering only the states in which trial studies have been made, the areas may be grouped accordingly; a. Trials very promising: Pennsylvania, New York, Connecticut, Massachusetts, Northern Maryland, the Great Lakes section, including parts of Ohio, Michigan, Indiana and Illinois; parts of South Dakota, Nebraska and Colorado. b. Trials fair, parts of Kentucky, Tennessee, Virginia, W. Virginia, and New Jersey. c. States showing little promise, namely—Alabama, Florida, Georgia, North Carolina, South Carolina and Texas. This is quite a general conclusion and there may be areas in the higher elevations in both groups, b. and c., where pyrethrum will do well.

The pyrethrine content of the flowers appears to be little influenced by

1. Geographical location of the area where grown.
2. pH of the soil.
3. Soil type.
4. Fertilizer treatment.

Table 1 gives the elevation, latitude, rainfall, soil type and pH of several pyrethrum locations and the total pyrethrines from bulk samples of flowers. (1-3 year tests.)

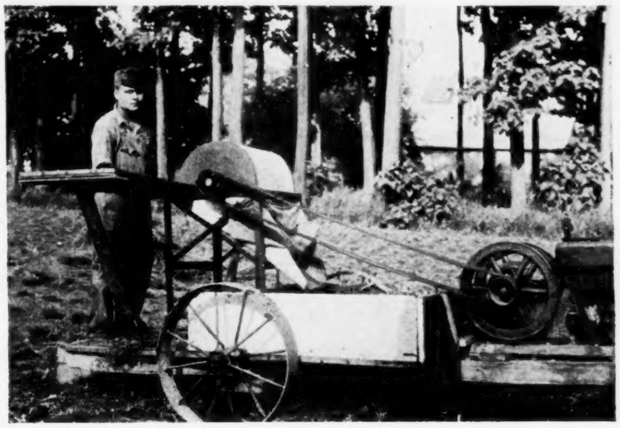
When high applications of lime and sodium carbonate were made, the total pyrethrine content was lowered (Table 2). On these plots the nitrates were high and, as a result, the opening of the flowers was retarded. The flowers from plots 8, 11 and 12 were harvested at the 1/4-1/2 open stage and this fact may account for their pyrethrine content.

At Wooster, Ohio, with a natural pH of 6.0, flowers from a plot with pH 7 analyzed .32% total pyrethrines while flowers from a plot with pH 5.48 analyzed .33%. (Flowers taken at 1/4 to 1/2 open stage.)

European literature abounds with statements to the effect that flowers run higher in toxicity when grown on soils of pH 7 or slightly alkaline, but this statement does not hold true in these experiments.

Table 3 shows the effect of fertilizers on toxicity. Tables 1, 2 and 3 fail to show consistent differences in toxicity, and one is led to believe that the toxicity

Flowers showing varying degrees of openness. Right center, closed; left center, one-half open; upper, one-fourth open; lower, almost fully open.



A cylinder stripper.

of pyrethrum is independent of where the plant is grown or the treatment it receives. Similar treatments in Pennsylvania have so far failed to show any relation between fertilizer treatments and toxicity. A new series of 60 plots was laid out in 1935 as a further check on this work.

In all experimental work with pyrethrum care must be exercised to harvest the flowers at the same degree of openness, since the stage affects the toxicity perhaps more than the treatment. In general, the flowers should be cut when they are 3/4 to fully open, but not blown. The degree is measured by the disc florets which open from the outside circumference towards the center.

Table 3

Effect of Fertilizers on Toxicity (Kentucky)

	Treatment, Acre, in Duplicate	*Toxicity*
1.	Check	.509
2.	Cal-Nitro, 50 lbs. applied Ap. 3	.467
3.	Sodium Nitrate, 150 lbs. applied Ap. 3	.599
4.	Check	.527
5.	Sodium Nitrate, 150 lbs. applied at bud stage	.517
6.	Sodium Nitrate, 300 lbs. applied Ap. 3	.532
7.	Check	.456
8.	Sodium Nitrate, 300 lbs. applied at bud stage	.511
9.	Sodium Nitrate, 500 lbs. applied Ap. 3	.564
10.	Check	.633
11.	Sodium Nitrate, 500 lbs., bud stage	.577
12.	Sodium Nitrate, 100 lbs. Ap. 3, 150 lbs. bud, 50 lbs. applied 2 wks. later	.495
13.	Check	.591
14.	Sodium Nitrate, 300 lbs., KCl, 50 lbs. Ap. 3	.547
15.	Sodium Nitrate, 300 lbs., KCl, 75 lbs. Ap. 3	.505
16.	Sodium Nitrate, 300 lbs., Acid Phosphate, 300 lbs. Potassium Chloride, 50 lbs. applied Ap. 3	.497
17.	Check	.530
18.	Ammophoska, 75 lbs. applied Ap. 3	.567
19.	Ammophoska, 75 lbs. applied bud stage	.457
20.	Check	.508

The author standing in a four-year planting.

Table 4

Effect of Stage of Disc Florets on Toxicity

Source of Flowers	*Disc stage*	*Toxicity*	*Disc stage*	*Toxicity*
Raleigh, N. C.	½ open	.45%	¾ to fully	.76%
Norfolk, Va.	⅓ open	.29%	⅔ to fully	.48%
Williamstown, N. J.	¼ to ½	.47%	¾ to fully	.76%

Table 2

	Treatment	*pH*	*Plants acre*	*Dry weight gms. per plant*	*Acre Yield*	*Total Pyrethrines*
1.	Check	5.63	8701	38.2	732	.759
2.	2000 lbs. Sulfur	4.64	"	36.2	694	.631
3.	1200 lbs. Sulfur	4.70	"	36.0	689	.714
4.	Check	5.56	"	36.0	689	.612
5.	600 lbs. Sulfur	4.80	"	36.5	699	.609
6.	500 lbs. Hydrated Lime	5.90	"	35.7	684	.670
7.	Check	5.66	"	38.3	734	.603
8.	2000 lbs. Hydrated Lime	7.38	"	36.7	703	.465
9.	4000 lbs. Hydrated Lime	7.82	"	33.0	632	.560
10.	Check (carbonate)	5.65	"	36.3	695	.662
11.	2000 lbs. Sodium	7.19	"	34.1	653	.484
12.	2000 lbs. Na_2CO_3 500 lbs. Hydrated Lime	7.6	"	38.4	735	.428
13.	Check	5.56	"	37.5	718	.560

Coupled with the decrease in toxicity, there is an increase of as much as 100% in weight between the closed and 3/4 open stages. Partly ripe flowers are still heavier, but are lower in pyrethrines.

Plants themselves vary in pyrethrine content, so in order to reduce experimental error to a minimum, sibs from tested plants should be used whenever possible.

Space does not permit the citing of more experimental evidence, but the following facts have been found, namely:

1. There is no loss in pyrethrines when flowers are dried artificially at 140 degrees F. or under.

2. Flowers dried on the stems and stripped when dry test the same as dried flowers stripped while green.

3. Plants grown side by side from seed secured from France, Algiers, Switzerland, England, Austria, Dalmatia, and Japan, show little or no difference in toxicity.

4. At the proper stage of harvesting, the proportion of green flowers to stems usually runs 35-40% to 65-60%. This changes when dry to 30-35% flowers to 70-65% stems.

5. Flowers run somewhat higher in pyrethrines when dried in the shade than when dried in the sun.

6. American-grown flowers are equal to and in many instances superior to imported flowers.

7. Plants live longer and do better when the stems are cut off 3-4 inches from the ground at time of harvest. Stems on plants left for seed should be cut off above the new crown.

8. Propagation on a commercial scale by division is impractical.

9. Pyrethrum is subject to several diseases which have been studied, namely, Sclerotinia Sp., Rhizoctonia, Fusarium Wilt and Alternia Leaf Spot.

Synthetic Oils Obtained by the Aluminum Chloride Process

By C. H. S. Tupholme

The British Fuel Research Station reports that the production of synthetic oils by the treatment of low-temperature gas- and tar-spirits with anhydrous aluminum chloride has recently been carried out on a larger scale. A quantity (about 80 gallons) of gas spirit from the carbonization of coal at a temperature of about 650°C. has been treated, with a view to obtaining viscous oils by polymerization of the unsaturated hydrocarbons. The spirit was washed with one-third its volume of caustic soda (sp. gr. 1.111) to remove tar acids and dissolved hydrogen sulfide, with sulfuric acid (sp. gr. 1.07) to remove the alkali, and finally with water. It was dried, and then refluxed for 12 hours at 78°C. with seven per cent. by weight of powdered aluminum chloride. A 60-gallon iron still fitted with a stirrer and reflux condenser was used. After separation from the sludge, the product was washed with caustic soda (sp. gr. 1.111) and with water. It was topped to 220°C., using superheated closed and open steam in an iron still. The residue, some 23 per cent. by weight of the original spirit, will be distilled under reduced pressure and the fractions examined in detail. Analysis of the spirit before and after treatment gave the results shown in Table 1.

Table 1	Unsaturated hydro-carbons	Aromatic hydro-carbons	Saturated hydro-carbons
Original spirit % by weight	32.0	28.2	39.8
Spirit after treatment % by weight	1.3	30.7	68.0

It is seen that the unsaturated hydrocarbons have been almost completely eliminated from the spirit fraction by polymerization, with the production of higher boiling oils.

A sample of the residue was distilled in the laboratory under reduced pressure with superheated steam, and four grades of viscous oil were collected. Grade I corresponded roughly to a spindle oil, grades II and III, together, to a motor car oil, grade III, alone, to a cylinder oil, and grade IV to a heavy gear oil. The combined yields amounted to eight per cent. by weight of the spirit treated. They were all clear, good-smelling oils, yellow in color, and possessing a faint blue fluorescence. By courtesy of the Anglo-Persian Oil Co., these fractions were examined in their Research Laboratory, and the results in Table 2 were obtained using the Air Ministry Oxidation test.

Table 2

Oil:	I	II	III	IV
Carbon residue before test	0.10	0.17	0.16	0.15
Carbon residue after test	1.43	0.85	1.72	1.56
Increase	1.33	0.68	1.56	1.41
Viscosity at 100°F. (Stokes):				
Before test	0.310	0.784	2.32	7.53
After test	1.243	1.505	10.2	37.6
Ratio of viscosities	4.01	1.92	4.38	5.0
Viscosity at 200°F. (Stokes)	0.0463	0.0746	0.132	0.195
Viscosity index	+11	—12	—43	—195

Compared with petroleum oils, these oils have very poor viscosity indices. Oils I and II might be used in cases where they would not be subjected to high temperatures. With respect to stability to oxidation, Oil II is fairly good but the others are poor. It may be emphasized that the oils above referred to were obtained by the direct fractionation of the product from the aluminum chloride treatment and had not been submitted to any refining processes.

In the event of this process being worked on a large scale, a considerable amount of middle oil, with a boiling range from the end of the spirit to the beginning of the viscous oil, would be produced. This would find an outlet as Diesel fuel since it has the necessary properties. It has a density of 0.870 at 20°C., an aniline point of 35.6°C., and a spontaneous ignition temperature in oxygen of 280°C.

The higher-boiling fractions of a low-temperature tar neutral oil have also been submitted to treatment with anhydrous aluminum chloride. On fractionation of the product, middle oils and viscous oils were obtained similar in both yield and properties to the oils obtained from the light spirits.

Platinum Summary 1934

Platinum refiners in the U. S. reported purchases of domestic crude platinum from the following sources in '34; Alaska, 2,190 oz.; California, 361 oz.; Oregon, 132 oz.; Washington, 1 oz., and unspecified, 137 oz.—a total of 2,821 oz. (508 oz. in '33). Refiners in the U. S. also reported purchases of 51,810 oz. (58,897 oz. in '33) of foreign crude platinum—12 oz. from Canada, 47,871 oz. from Colombia, 3,595 oz. from South Africa, and 332 oz. unspecified. Reports from refiners of crude platinum, gold bullion, and copper indicate that 47,274 oz. of platinum metals were recovered in the U. S. from these sources in '34, a decrease of 8.3 per cent. compared with '33.

CHEMICAL

The Photographic Record

The fall season finds executives of the chemical industry busily laying plans for sales expansion. The Parker Rust Proof sales campaign is directed from this desk by G. E. Luke, vice-president in charge of sales.

The Eastern Sales Manager of Dow, Ralph E. Dorland, at his desk in Rockefeller Center.

In Chicago the "sales" of Merchants Chemical Company is in the hands of H. McAndrew.

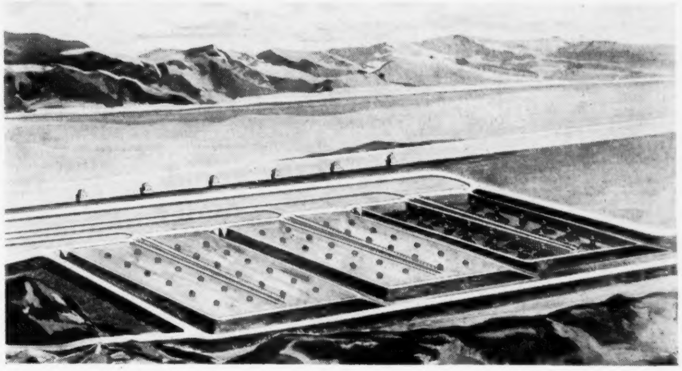
Below, right, H. R. Wemple, sales manager, Texas Gulf Sulphur, with his assistant, C. M. McNulty.

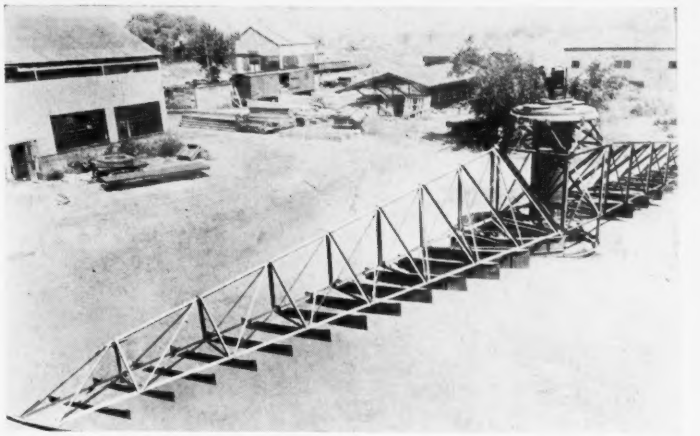
H. Gordon MacKelcan, vice-president in charge of sales, Innis, Speiden.

A sales conference at Merrimac Chemical, with William M. Rand, vice-president and sales manager, and Horace Burrough, assistant sales manager, planning the fall campaign.

NEWS REEL

of Our Chemical Activities





To the left, artist's conception of the proposed desilting plant to be erected on the Colorado River fifteen miles northeast of Yuma, Arizona, at the Imperial Dam about 250 miles below Boulder Dam. Seventy-two Dorr Thickeners, similar to the one shown above, each 125 feet in diameter, will remove between 50,000 and 70,000 tons of silt daily from a flow of about 8,000,000,000 gallons a day. In the experimental work, tons of the Colorado River water were transported to Dorr's experimental laboratory at Westport, Conn.

Below, the Monsanto, Illinois, plant baseball team after a successful season is tied for first place in the East St. Louis Independent League.

Above, extreme right, F. W. Pickard, du Pont vice-president, who is a mighty fisherman in his leisure moments, is glimpsed here with Mrs. Pickard in search of Canadian salmon. Below, "The March of Chemistry" exhibit of du Pont at the recent Eastern States Exposition held in Springfield, Mass. Of an educational nature, the exhibit covered a wide range of chemical products, including several new developments of du Pont research laboratories, showing how they are made, how used, and how they serve the ultimate consumer.

New Products and Processes

A Digest of the Current Literature for the User of Chemicals

Degumming and Bleaching Natural Silk

A Study of the physical and chemical properties involved

The diameter of the filament of silk varies between 0.013 and 0.25 mm., yet its strength approaches that of a thread of iron of the same section. A thread of silk, 1 mm. in circumference may support a weight of 44 kilos. It requires a force three times as strong to break it, as would break a fiber of linen of the same section, and twice as strong as that for breaking a similar jute fiber.

It is much the same with regard to the elasticity of the fiber. A filament of natural silk may be elongated by one-seventh to one-fifth of its original length without rupture. Many operations are founded on this property of silk, such as imparting to it a uniform aspect, and lustering. Moist silk is more elastic than dry. Boiled-off silk loses somewhat in strength and in elasticity. It is the same with weighted silk, and the higher the degree of weight added, the more the strength and elasticity diminish. Another property of silk is its capability of acquiring the greatly valued scroop handle. Yet raw silk, and even boiled-off silk, do not exhibit this property, but only after certain manipulation which accompanies dyeing. After dyeing, the silk is treated with a dilute solution of soap and then a solution of acid, after citric acid.

Hygroscopicity of Silk

A satisfactory explanation of this phenomenon has not yet been given (*The American Silk & Rayon Journal*, August '35, p37). The specific weight of silk is 1,367. Silk is a poor conductor of electricity, yet is easily electrified by friction and remains in that state for a long time. When silk is heated to 110° C., it naturally loses its moisture, but is not modified; heated to 170° C. it is destroyed and carbonized. While burning it does not give the disagreeable odor characteristic of burning wood. A property very important in commerce is the hygroscopicity of silk; that is, its power of absorbing an important quantity of moisture from the atmosphere, even to the extent of 30 per cent. of its weight without appearing to be moist. That accounts for the accomplished establishment of conditioning houses, the object of which consists in reducing the weight of a certain quantity of silk admitted, or in other terms, fixing the normal weight of the silk. The amount of moisture permitted is about 11 per cent. but varies in different countries.

The fiber is composed principally of two compounds. The main part of the fiber is fibroin, which is obtainable by successive and alternate treatments with hot water, absolute alcohol, ether, and acetic acid. Silk contains about 66 per cent. of fibroin. Upon burning it gives a porous carbon with 0.6 to 1 per cent. of ash, which consists of magnesium, calcium, sodium, iron, aluminum, and manganese in combination with chlorine, carbonic acid, and phosphoric acid. The proportion of ash found in raw silk is about 1.1 per cent., in boiled-off silk 0.77 per cent., and in weighted silk as much as 14 per cent. The silk fiber is enveloped by a second substance, the gum or sericin. Small amounts of wax-like bodies, glycerides, and in yellow silks a coloring matter which is really a modified chlorophyll, are also found. Silk is not only hygroscopic, but may easily absorb rapidly other liquids such as alcohol and acetic acid, and exhibits great powers of retaining them.

This capacity is extended also to saline solutions, sugar, tannin, and those of metallic salts, as well as the majority of soluble coloring matters. It shows less affinity for the natural coloring matters. Boiling in water removes a part of the envelope formed by the gum, but does not remove the wax and the coloring matter. If the boiling is continued too long, the strength of the fiber suffers. All liquids have a solvent action. Dyeing should be accomplished therefore at a temperature as low as possible. Concentrated solutions of caustic soda and carbonate of soda readily attack silk, especially when hot. A neutral soap is inoffensive and for this reason is used for the boiling-off of silk, but by prolonged boiling the fiber is attacked. Ammonia in the pure state, even hot, does not attack the fiber, yet on the other hand, ammoniacal compounds of certain metallic salts, such as oxide of copper and oxide of nickel, easily effect solution of the fiber. Lime and baryta attack the gum covering on the silk. Concentrated mineral acids rapidly dissolve the fibroin but are not harmful diluted.

Permanganate of Potash as an Oxidizer

Permanganate of potash oxidizes the silk fiber at the same time as it forms oxide of manganese as a precipitate on the fiber, and by treating them with sulfurous acid the brownish precipitate is removed and a nice white fiber results. Permanganate of potash cannot, however, be used for the proper bleaching of silk, because it imparts to the silk the feature of becoming eventually yellowish under the action of alkalies. Proper bleaching is most generally accomplished by means of sulfurous acid. Bichromate of potash and chromic acid are absorbed and held strongly by the fiber. Chromic acid is not reduced to the oxide. Hypochlorites and chlorine rapidly destroy silk.

Concentrated organic acids, such as acetic, citric, and oxalic are without action in the cold, but at higher temperatures cause the fiber to become friable.

Salts of the heavy metals, lead, zinc, copper, iron, and aluminum are absorbed freely by silk and in part decomposed and remain on the fiber in the state of their less soluble basic salts. Numerous salts, such as oxide of zinc, and those of iron, serve through the fixation of basic salts, for the weighting of silk.

Ceramics

"Tam Hy-Opax" is a new zirconium oxide opacifier, manufactured by Titanium Alloy Mfg. Co., Niagara Falls, N. Y. It is said to yield, when used at the mill, pound for pound in place of tin oxide, sheet iron enamel finishes having equal coverage, equal lustre, and the same color as compared with the tin oxide enamel and with the opacity or reflectance readings in general about the same as the corresponding tin oxide bearing enamel.

Cement for Repairing Porcelain

An instant-hardening filler cement, Vit-Re-Pair, for repairing cracked or damaged surfaces on various porcelain finished products and appliances is announced by Vitrowhite Co., 1456 Thome Ave., Chicago, Ill. It is easy to apply, lustrous and permanent; and is supplied in several shades of white, black and special colors.

Coatings

Synthetic resins, known as "Acronals" are being produced in Germany, according to *The Chemical Trade Journal*, Sept. 6, '35. These polymerized vinyl compounds are characterized by their clear colorless appearance and complete absence of odor. They are also stated to be highly resistant to cold, unaffected by petrol, and to possess a degree of elasticity "comparable to rubber." Acronal is marketed in two forms—Acronal 1, which is a 25% solution in ethyl acetate; Acronal L 100 and L 200, both of which are aqueous emulsions of the pure polymerized vinyl compounds without any solvent or plasticizer.

Touch-Up Metallic Coating

A new touch-up material, which is an improvement on their Amco metallic coatings, is announced by American Solder and Flux Co., Wayne Ave., and Berkeley St., Phila., Pa. The metallic coating, formerly supplied as a separate metal and flux, is now furnished in powdered form, and is recommended for touching up spots in work that has not received a good coat, or where brazing, welding, etc. have burned away the original coating.

Synthetic Resin with Low Price Possibilities

Designed to cut China wood oil consumption in half, 78A Synthetic Resin, product of Manufacturers' Trading Co., 3135 East 26th St., Los Angeles, Cal., offers the varnish maker a wide variety of possibilities in formulating in such a manner as to take advantage of low priced oils.

Coating for Plating Racks

Korolac is a new synthetic, rubber-like material for use as a corrosion resistant coating for plating racks, recently introduced by the B. F. Goodrich Co., Akron, O.

Surface Coating for Prevention Oxidation

Recommended for the prevention of oxidation is a surface coating for paint, varnish, lacquer, metal (brass, copper, bronze, etc.), which can be applied with a spray gun, soft cloth, or lamb's wool applicator. Developed by the Franklin Research Co., 5134 Lancaster Ave., Phila., Pa.

Revolutionary Coating for Iron and Steel

Red lead has long been recognized as the leading protection for structures of iron or steel. With red lead, however, as with other protective coatings, the protection afforded was predetermined by the oxidization rate of the binders. In addition, a clean surface was absolutely necessary, often involving the use of sand-blasting and chipping with pneumatic hammers. A new product, formulated with chlorinated rubber as a base, does away, it is reported, with the necessity of thorough cleaning. The loose scale is brushed off and the product, marketed under the name Rust-Eeter by the Harrington Paint Co., 1632 Collamer Ave., East Cleveland, Ohio, is applied directly. It digests the oxide present on the surface and converts it into an essential part of the protective film. For this reason the removal of rust is not desired. Of special interest to plant managers, maintenance engineers, aside from the economy in its use, is the fact that it produces a film highly resistant to acids, alkalies and other elements destructive to paint. It has great mechanical strength, producers claim, and has excellent adhesive powers.

Textiles

In a review on the action of disinfectants on various types of rayon, L. Schioppa in *Ann. Igiene*, 44,698, states that corrosive sublimate in 2% solution does not attack the undyed or dyed fabrics after contact for 30 minutes. But exposure to phenol (5% sol.) for an equal period leads to action upon dyed fabrics, the solution becoming slightly colored. Cuprammonium rayon is less resistant than viscose or acetate. Black or red colored cuprammonium rayons part with their dye to some extent after immersion for 30 minutes in a 20% formaldehyde solution.

Wetting Agent

A mixture of Turkey-red oil, waste sulfite lye, and an alkali phosphate is listed in French Pat. 777,860, as a suitable wetting agent for textiles. I. G. holds the patent.

Sodium Sulfite for Production Rayon from Cellulose

The Borvisk Syndicate has been granted a patent for the production of rayon materials from cellulose by a method in which all the usual operations are carried out by treatment with one chemical agent. Sodium sulfite is recommended as being suitable.

Rubber and Rayon Yarn

It is understood that Harben's, Manchester, England, is planning production of a new type of extensible yarn; i.e., a rubber core covered with rayon. Company's production plans also include a staple fiber.

Velvet Waterproofing Process

A concern in Lancashire, England, has developed a new process for waterproofing velvet.

Hollow Filament Staple

A British chemist, Fred Ferrand, after 25 years research, has succeeded in producing on a commercial scale a hollow filament staple. Process consists of passing air and viscose or other spinning solution through the jet simultaneously. The air forms the filaments into hollow tubes, and by intercepting the air regularly the ends of the filaments on coagulation are sealed, and the length of the filaments which form the staples are regulated by the duration of the air between each interception.

Cellulose Acetate from Rayon Waste

Process for the manufacture of cellulose acetate from the waste of the viscose rayon and transparent cellulose industries is mentioned in *L'Industrie Chimique*, Feb., '35. The principle is the subjection of materials to a preliminary treatment with alkali, to reduce their resistance to acetylation. The waste material, cut into small pieces, is treated for thirty minutes at 60° C. with 2% solution of sodium carbonate; then at 80° C. with 1% solution, and, finally, at the boil for ten minutes with 0.5% solution. The product is washed, first, with 1% solution of acetic acid, and then with hot water. The purified cellulose is then gradually acetylized at an initial temperature of 16-18° C. for 39 to 44 hours, the temperature rising during the process to 80° C.

Bentonite in Textile and Laundry Processes

Several cleansing preparations containing bentonite are now on the English market, according to *Soap*, August '35, p33. For some textile uses and certain laundering processes it is said to be superior to alkali such as soda ash, and it imparts, even to high-grade toilet soaps, an improved texture and softer and smoother surface.

Month's New Dyes

Chromoxane Brilliant Violet SBN, a new chrome color produced by I. G., is being offered to the trade by General Dyestuff. Dyed from a Glauber's salt-sulfuric acid bath and after-treated with bichromate, it produces bright violet shades of very good fastness to washing, fulling, potting and decatizing. It is of good solubility and may be used for printing on wool; giving a good white discharge with Rongalite CW. Also recommended for brightening navy blues.

Diazo Brown 6GA, released also by General Dyestuff, is a color which produces with Developers ZA, A and MT yellowish browns which are of good fastness to washing and easily dischargeable.

Unusual Waterproofing Compound

Sandoz Chemical announces a new compound, Cerol TFS, recommended for waterproofing textiles in a water emulsion at any temperature, even the boil. With this it is possible to obtain better penetration on heavy fabrics which cannot be properly impregnated at low temperature.

Solubilizing Agent for Starch

Aktivin-S, product of Aktivin Corp., is being marketed by American Aniline Products, Inc. Adopted as a solubilizing agent for starch in sizing and finishing, it is capable of producing sizes and finishes possessing excellent penetrative power which is particularly valuable in the finishing of piece goods.

Rubber

Development of a low viscosity Tornesit (20-35 centipoises) is announced by Hercules Powder. With a solution of 75 centipoises it is possible to spray a Tornesit concentration in xylol of 24%. This development should broaden the field of metal protective coatings for paint manufacturers.

Rubberizing Compounds

Self-Vulc rubberizing compounds, in two forms, liquid and plastic, are being manufactured by the Self-Vulcanizing Rubber Co., 605 W. Washington Blvd., Chicago, Ill. Improvements in the liquid rubber have resulted in a new priming compound which makes good results possible by the application of a single priming coat. The rubber vulcanizes when exposed to air. The plastic rubber also requires only one prime or preliminary coat, vulcanizing itself cold on air exposure. These compounds may be used to protect inside and outside surfaces against abrasion, corrosion and acids, as well as to waterproof all kinds of containers. Another suggested use is to restore surfaces of materials which have been worn away by abrasive actions.

Thiokol D

Thiokol D, an oil proof synthetic rubber with a tensile strength up to 1700 lbs. per sq. in., has been put on the market by the Thiokol Corp., Yardville, N. J. While it will stand lower temperatures, it is claimed to be very flexible at —45° F. Showing good resistance to high temperatures, it will stand hot oil at 200° F. Among the many features claimed for it are: Elongation around 500%; abrasion resistance of the order of rubber; tear-resistance equal to or better than rubber; mild, not objectionable, odor; and, in addition to being oil proof, has good resistance to Duco thinners, lacquers, printing inks, benzo-gasoline blends and most ordinary solvents. It is sold in crude sheet form corresponding to natural crude rubber.

Brake Lining Resins

Increased speed in motor cars brings need for increased stopping power of brake lining, and to cope with the terrific frictional heat and wear developed in the newer cars, General Plastics has developed two improved resins for incorporation in rubber linings as well as the impregnated woven type. Use of these thermosetting phenolic resins gives greater water, oil and heat resistance to the linings and results in a more uniform coefficient of friction, thus giving longer wear and better braking qualities. 175 resin is recommended for use in conjunction with rubber, and Durez 1606 resin for the impregnated woven linings.

Rubber Softener

Recent experiments in Russia show that sapropel tars may be substituted for Rubrax, a softener applied to rubber compositions. They can also be used instead of stearic acid for increasing the activity of vulcanization accelerator. The presence of sapropel tar in rubber goods increases their durability and prevents ageing during prolonged storage.

Chemical Specialties

Tegul, a new sulfur jointing compound for bell and spigot pipe, is a plastic sulfur cement, developed by Mellon Institute. C. R. Payne, *Water Works & Sewerage*, Sept. '35, p317, states that the plasticizing agent is an olefine polysulfide, with whose aid it is possible to produce cements of varying plasticity. Tegul cements have greater bonding strength and are many more times resistant to mechanical and thermal shock than ordinary sulfur compounds.

Cleaning Painted Surfaces

An economical way of using regular or special soaps for maintenance cleaning of all painted surfaces—particularly railway and street vehicles; also, interior surfaces and various finished products, is possible by using Murphy's Sudzrite System, product of The Phoenix Oil Co., 2554 W. 5th St., S. W., Cleveland, Ohio. A simple means is provided to produce, inside a drum, soap suds solutions which are uniform as to the amount of soap per gallon of water. This system is recommended where a large amount of very particular cleaning work is to be performed effectively and at low cost.

Can Sealing Compound

A can sealing compound, that can be used for producing films and for waterproofing textiles and other materials, comprises alginic acid and rubber latex. Patent for same has recently been granted to Bernard F. Erdahl, Chicago, Ill.

Agricultural Chemicals

Thiocyanate solutions are valuable in agriculture, especially for weed destruction, particularly from the point of view of safety. Successful trials on the use of thiocyanates conducted last year in New Zealand are described by B. C. Aston, J. A. Bruce, and J. B. Thompson (*New Zealand Journal Agriculture*, 1935, 50, No. 3, pp. 164-172, through *Bull. Imp. Inst.*, No. 2, 1935). Solution formulas and results obtained are also recorded.

Superphosphate for Direct-Application

A granular "Aero" superphosphate containing 32% available phosphoric acid for direct-application purposes is being marketed by American Cyanamid. The new high-analysis material comes in the form of free-flowing pellets, with no tendency to

cake on standing. It can be evenly applied by the use of any of the ordinary fertilizer distributors, and no special precautions are necessary in its use.

Plants Need Boron

Dr. John W. Shive, New Jersey Agricultural Experiment Station, has demonstrated by experiments that boron and manganese are essential in plant growth.

Tests on Hydrogen Peroxide as Seed Disinfectant

Dr. Winkelmann, in a note to the *Chemiker-Zeitung* on the proposal to use hydrogen peroxide solution as a seed disinfectant, states that although laboratory trials may have shown promising results, the only field experiments so far reported: namely, those of Pichler ("Phytopatholog. Ztsche.," 1935, 8, 245-251) indicate that the peroxide is not likely to replace the seed disinfectants at present in use.

Glass

Of interest to chemical engineers is Chance's Calorex glass, which gives approximately 60% light and only 20% heat transmission, permitting adequate natural illumination without the disadvantage of excessive heat. These conclusions by W. M. Hampton, *Chemistry and Industry*, 54, 387-391, are borne out by wide experience in tropical countries.

Plaid Colors in Glass

Unusual results in color glazing on glass, including Scotch plaid patterns, are being achieved by the Nu-Art Colorglaze Co., Inc., San Francisco. Formal glasses are being produced in multiple colors and burnished gold and platinum.

Metals and Alloys

A powerful magnetic field impressed on a mass of hot metal while the metal is allowed to cool slowly will change the internal structure of the metal and give it greater magnetic permeability, or ability to accommodate more magnetic lines of force. G. A. Kelsall, of the Bell Telephone Laboratories, who has been testing the new alloys called "permalloy" and "perimvar," states that quick cooling of the alloys was previously used to produce the effect to a smaller extent. By using the magnetic field, a permeability of 100,000 was obtained whereas with the heat treatment it was only 14,000. The effect is directional, being greatest in the direction of the field applied, and least at right angles to it. In one sample the ratio of the two effects was 70 to 1.

Brass Die Casting Alloy

Production of Doler Brass, a new brass die casting alloy, containing copper, zinc, and silicon, has been started by Doehler Die Casting Co., 386 4th ave., N. Y. City. It is especially adapted to the die casting process, resulting in a fine finish when cast. It has the following unusual physical properties:

Tensile Strength	65,000—75,000 lbs. sq. in.
Yield Point	30,000—40,000 " " "
Elongation	20—25% in 2"
Reduction Area	20—25%
Brinell Hardness	110—120 (500 Kg.)
Impact Strength	30—36 ft. lbs.
Color	Light Yellow

Metal Foundry Uses Soda Ash

An exhibition of the sodium carbonate process for the refining of cast iron and non-ferrous metals was staged by I. C. I. last month at the Foundry Trades Exhibition. *Chemical Trade Journal* describes process which consists of the treatment of metals with a highly reactive slag, which has a refining, degasifying action, and removes sulfur, oxides, silicates, etc. Castings so treated are sounder and free from porosity, and have better machining properties; while for those required to withstand hydraulic pressure, the treatment is specially useful. The reduction of the sulfur content is of particular value in connection with steelmaking, and with sodium carbonate it is frequently possible to use a cheaper mixture in the cupola.

Miscellaneous

Use of gases for preserving fruits and meats is being employed extensively in the United Kingdom and in vessels carrying fresh meats from Australia, according to reports from the American Consulate, London, made public by the Commerce Department's Chemical Division. This system which employs carbon dioxide, or common soda fountain gas, and oxygen, has been carefully studied by the Department of Scientific and Industrial Research, and it is alleged that foods so stored retain their full flavor and freshness.

Softening water through the use of barium salts was the topic of a paper by Dr. E. Seyh, to a meeting of the Verein Deutscher Chemiker, reported in *Chemical Age*, August 2, '35.

Zinc Pigments Affect Paper Fiber Purity

Consideration of fiber purity in terms of alpha cellulose content and copper number has been recommended by the National Bureau of Standards in choosing record papers that are required to have a long life. It has been found, however, that when papers contain zinc pigments, the test values obtained by the present methods are affected. Amounts of zinc sulfide commonly used in papers appreciably increase the test values for both alpha cellulose and copper number. Furthermore, the total acidity value, obtained by titration of an aqueous extract of the paper, is reduced. Until modified testing procedures can be developed to avoid the errors caused by the zinc pigments, the probable stability of papers containing them must be judged in another way.

Sodium Chrom Glucosate for Control Corrosion

Sodium Chrom Glucosate, an alkaline organic chromate for the control of corrosion in brine- condenser- and other aqueous systems where water is not used for human consumption, is announced by D. W. Haering & Co., 3408 Monroe st., Chicago, Ill. Provides efficient corrosion control in brine systems between a pH of 6 and 12, offering a wider range of protection than is possible with inorganic chromates.

Arsenic Concrete

In the construction of a canal inside the Sote Fjord in Sweden, the piles and other timbers used in construction of the fenders to protect vessels from damage by the canal's rock sides were sprayed with the "arsenic concrete" developed by the Boliden Mining Company. The spraying mixture of arsenic, cement and sand used in protecting the piles and timbers was in the proportion of 1:3:12.

New Type Gravel Roads

A density equal to Portland cement concretes has been developed by a new type gravel road, made possible through soil studies of the U. S. Bureau of Public Roads. In test samples, weights of 145 to 154 lbs. per cu. ft. were shown by stabilized gravel taken from roads which had been in service a year or more. This is approximately the same as the weight of Portland cement concrete, which averages about 150 lbs. per cu. ft. Gravel, clay and calcium chloride were used in the construction of the roads tested.

Trisodium Phosphate for Softening Leather

The value of trisodium phosphate in the leather industry is indicated by M. Queroix (*Le Cuir Technique*), who says that the high reputation which leathers from certain localities have is due to some extent to the suitability of the water

available. In addition to its use in direct water treatment, it can be advantageously used in the leather industry in softening skins that have become hard on storage; in the neutralization of chrome leather; in detanning semi-chrome, and in the progressive rendering alkaline of chrome liquors during the tannage process.

New Specifications for Petroleum Diluents

Chemical Solvents, Inc., 11 Park Place, New York City, offer improved specifications on petroleum diluents which they have been supplying to the trade. New specifications for Lactol Spirits show a much closer range and consequent better toleration in pyroxylin formulations. This closer range increases opportunities to take advantage of the properties of this product as a solvent and as replacement for a large percentage of the toluol in most formulas. Kemsolene, in addition to its properties as a solvent and extender, is finding a wide application for the cleaning of furs and fine fabrics. This product has the additional advantage of having a flash point above 80° F., requiring no red label.

Booklets and Catalogs

Chemicals

A371. American Aniline Products, Inc., 50 Union sq., N. Y. City. "Aktivin-S as a Solubilizing Agent for Starch in Sizing and Finishing, reproducing Micro-Photographs Showing the Action of Aktivin S on Potato Starch."

A372. American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, N. Y. City. "Specialties for the Tanning Industry," attractive and well edited booklet, describes use of Cyanamid products in leather tanning. Will be of interest to any leather producer.

A373. Carbic Color & Chemical Co., Inc., 451 Washington st., N. Y. City. "Indigosol Dyeings on Cotton Pieces," new Pattern Card Sol. K. 60.

A374. Commercial Solvents Corp., 230 Park ave., N. Y. City. September *Alcohol Talks*—discusses "Bees, Bacteria, Alcohol, and Adam," describing dependence upon alcohol of bees and men. Another interesting article in a unique series.

A375. Diamond Alkali Co., Pittsburgh. Booklet for alkali users.

A376. J. B. Ford Co., Wyandotte, Mich. New tabloid newspaper, "Here's How Wyandotte is Used," published in the interests of Wyandotte Products.

A377. Fritzsche Bros., Inc., 78-84 Beekman st., N. Y. City. September wholesale price list is available.

A378. Givaudan-Delawanna, Inc., 80 5th ave., N. Y. City. Do cosmetics encroach on medical domain? August *Givaudanian* contains excerpts from R. M. Gattefosse's articles on "The Skin" and "Absorption through the Skin," appearing in his French publication, *La Parfumerie Moderne*. An interesting answer to one of the cosmetic industries' prevalent questions.

A379. The Grasselli Chemical Co., 629 Euclid ave., Cleveland, Ohio. "Rex Arsenate of Lead" contains Grasselli's growers guide for insect control, a complete what, when, and how table for spray use.

A380. The Grasselli Chemical Co., Listing of "Chemicals, Spray Products, Cadalyte, Zinc."

A381. Hercules Powder Co., Wilmington, Del. *The Hercules Mixer* for September salutes its foreign subsidiary, N. V. Hercules Powder of The Hague, Holland, now celebrating its 10th anniversary. Many personal notes are included in this well written publication.

A382. Heyden Chemical Corp., 50 Union sq., N. Y. City. September price list is available.

A383. Johns-Manville, 22 E. 40th st., N. Y. City. August, *The Power Specialist*, tells of the recent Hiram Walker distillery fire and insulated roofing's part in preventing loss of entire plant.

A384. Magnus, Mabee & Reynard, Inc., 32 Cliff st., N. Y. City. September-October Price List and Catalogue.

A385. Mallinckrodt Chemical Works, St. Louis, Mo. September price list is available.

A386. Merck & Co., Inc., Rahway, N. J. September price list is out.

A387. Monsanto Chemical Co., St. Louis, Mo. September *Monsanto Current Events* describes Monsanto chemical uses in aircraft. A discussion of the value of research is the feature for this month.

A388. Monsanto Chemical Co., *Monsanto Chemicals* for August, 17th edition, includes listing of former Swann (now Monsanto) products as well as several new Monsanto products.

A389. The N. J. Zinc Co., 160 Front st., N. Y. City. Third issue of this new paper contains valuable information on machining practice.

A390. Thiokol Corp., Yardville (Trenton), N. J. "Thiokol" C—103, specifications for new synthetic rubber coating materials.

Equipment

A391. Paul O. Abbe, Inc., Little Falls, N. J. 8 page folder describing Abbe ball & pebble mills.

A392. Alsop Engineering Corp., 39 W. 60th st., N. Y. City. New 6-page booklet describes Alsop's "Hy-Speed Labelit and Stixit" equipment.

A393. American Tool & Machine Co., 1413 Hyde Park ave., Boston, Mass. 6-page bulletin on "Belt-Driven Centrifugals" describes all-steel, all-welded framework and other interesting innovations in these centrifugals.

A394. American Tool & Machine Co. 4-page booklet on A. T. & M. centrifugals.

A395. The Brown Instrument Co., Wayne & Roberts aves., Philadelphia, Pa. In its booklet, "Outstanding Performance with Simplicity," Brown offers complete line of air operated controllers, featuring the "Air-o-Line," temperature, flow, pressure, and liquid level control system.

A396. Continental-Diamond Fibre Co., Newark, Del. "Dilecto," phenol fibre, a laminated material, is thoroughly described in this attractive, and amazingly complete catalog. Specification and properties of all kinds are completely listed.

A397. The J. H. Day Co., Cincinnati, Ohio. New 4-page booklet on five roll pigment dispersion mill.

A398. Electro Metallurgical Co., 30 E. 42nd st., N. Y. City. September *Electromet Review* tells of more new and important uses for stainless steels. Variety of uses is truly amazing.

A399. Eppenbach, Inc., Long Island City, N. Y. Catalog specifications for inexpensive line of colloid mills, machines using rotors and stators and working under pressure.

A400. General Electric, Schenectady, N. Y. General purpose, automatic time switches, Types T-17 and T-27. Descriptions, specifications and additional necessary information.

A401. General Electric. "Power Selsyns," G.E.'s self synchronous apparatus, for lift bridges, hoists, unit printing presses, conveyors, elevators, kiln drives and other types of materials handling equipment.

A402. The Harrington Paint Co., 1632 Collamer ave., East Cleveland, Ohio. One page pamphlet describes "Rust-Eeter," new method protecting ferrous metal surfaces from oxidation by using rust itself as protective medium. An interesting development interestingly described.

A403. The Jeffrey Manufacturing Co., 944 N. 4th st., Columbus, Ohio. Catalog No. 610 on Belt Conveyors for those interested in modern conveyor layouts and assemblies.

A404. Johns-Manville, 22 E. 40th st., N. Y. City. Celite No. 110, new type inert for paints, suitable for many different paint uses. Booklet contains magnified photographs showing Celite-containing painted surfaces.

A405. The Linde Air Products Co., 30 E. 42nd st., N. Y. City. September *Oxy-Acetylene Tips* relates the interesting work leading up to oxy-acetylene welding usage in oil well casings.

A406. Link-Belt Co., 910 S. Michigan ave., Chicago, Ill. September *Link-Belt News* features descriptions of Link-Belt silent chain drives for machine tools. New link belt conveyor uses are also described.

A407. Pulmosan Safety Equipment Corp., 176 Johnson st., Brooklyn, N. Y. Catalog M-15 on "Bureau of Mines Approved Type 'A' Dusts Respirator."

A408. Pyrene Mfg. Co., Pyrene Bldg., Newark, N. J. "Firefax," new bulletin describing Pyrene installations and separate units.

A409. The Stonhard Co., 401 N. Broad st., Philadelphia. "Over the Rough Spots," 24-page booklet on building maintenance and construction materials. Profusely illustrated and informative.

A410. Struthers-Wells Co., Warren, Pa. New bulletin for users of mixing equipment.

A411. Surface Combustion Corp., Toledo, Ohio. Booklet describing standard burners and burner equipment.

A412. Synthane Corp., Oaks, Pa. "Synthetic Laminated Bakelite for Mechanical Applications." A listing of essential properties of Synthane.

A413. Terminal Warehouse Co. of New York, 27th st. & 11th ave., N. Y. City. "Field Warehousing, A Common Sense Method of Inventory Financing." Very complete, this booklet should be of great aid to producers faced with any type warehousing problem.

A414. Worthington Pump & Machinery Corp., Harrison, N. J. Specifications for Worthington double helical rotary pumps, types GS, GR, & GE.

A415. Worthington Pump & Machinery Corp. Worthington Deaerating Feedwater Heaters.

A416. Worthington Pump & Machinery Corp. Worthington Deep Well Turbine Pumps. Specifications, cost, and cost of operation.

Packaging

A417. J. L. Ferguson, Joliet, Ill. September *Packomatic* introduces something new in beer bottles, the "Stubby," an Owens-Illinois product. Included are personal articles of interest to packaging men.

A418. General Plastics, Inc., North Tonawanda, N. Y. August-September *Durez Packaging News* shows varied uses for molded plastics in widely divergent fields.

A419. Ivers-Lee Co., Newark, N. J. Booklet describing pharmaceutical packaging service and equipment with special emphasis on the Sanitape machine.

A420. Revolator Co., State st. at Bergen Turnpike, North Bergen, N. J. "The Art of Piling," booklet describing portable elevators for warehousing purposes. Very complete descriptions are given.

Received Late for Classification

Aluminum Co. of America, Pittsburgh, Pa. September *Aluminum News-Letter* describes new Toledo Plaskon Duplex scale, said to be largest single plastic casting yet made.

General Electric, Schenectady, N. Y. High Speed Synchronous Motors, "7500 Series." Type TS, 3-phase and type QS, 2-phase.

C. J. Tagliabue Mfg. Co., Park & Nostrand aves., Brooklyn, N. Y. Attractive bulletin announces new Tag No. 40 Controller, small, attractively built, and accurate.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets; specify by number: ....

....

Name ....
Title ....
Company ....
Address ....

Plant Operation and Control

A Digest of the Current Literature for Makers of Chemicals

Crystallization Methods—

A Typical Unit Process

By Hugh Griffiths

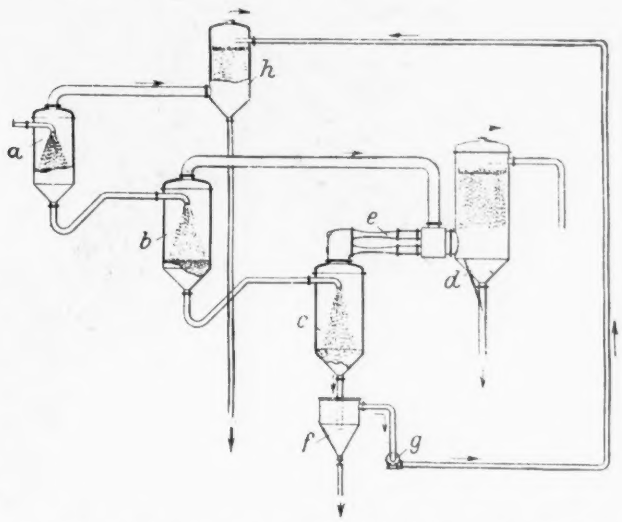
Separation of materials from solutions by crystallization is a process worthy of careful investigation. Tendency to regard crystallizing equipment simply as a device for abstracting heat or solvent has resulted in many costly failures. While it is correct to say that available knowledge of crystallization processes is still far from complete, it is beyond question that certain principles have now been established which are of great value to the designer of equipment, and it is now possible to design installations for a given production with a certain accuracy, and in many cases to obtain products not only of a high degree of purity, but in the individual crystal form, even from solutions which contain impurities.

In manufacturing processes of the type in which the size and appearance of the crystalline products are not important, crystallization equipment may be regarded as a cooler or an evaporator. It is, however, not possible to design crystallization equipment from heat transmission data alone, as in the case of a cooler for a non-crystallizing liquid. In many cases, even when agitation is employed, the crystalline material deposits on the cooling surfaces and rapidly reduces the heat transfer. Attempts to overcome this difficulty by means of brushing or scraping agitators have only been partially successful.

Necessity For Understanding of Basic Principles

A clear understanding of the nature of this problem can be obtained by a study of the super-solubility data. So long as the solution in contact with the cooling surface can be maintained in the metastable state the deposition of material on the cooling surface will not occur. While the adjustment of the condition does not present any overwhelming difficulty it will be understood that the maintenance of the metastable state necessitates the use of low temperature differences and in consequence for large-scale work vacuum cooling is now very frequently adopted. Even when organic solvents are used, the vacuum crystallizer can be designed more precisely as the heat transfer takes place in a surface condenser where a large heat transfer per unit area can be obtained by the use of a substantial temperature difference. When aqueous solutions are crystallized by vacuum cooling the condensation is preferably effected in a barometric condenser with corresponding advantages in capital cost and freedom from the limitations imposed by heat transfer. More recent installations of this type operate according to a multiple effect principle, enabling the heat contained in the solution to be utilized.

By application of steam jets for augmenting the vacuum attainable under ordinary conditions with cooling water at normal temperature, multi-stage vaçuum crystallizing equipment is now built in which solutions can be cooled and crystallized at temperatures down to —10° C. A scheme of this kind, which is now extensively used on a large scale chiefly in the potash industry, is shown.



A typical installation—a large crystallization unit: a, Evaporator (stage 1); b, Evaporator (stage 2); c, Evaporator (stage 3); d, Condenser; e, Steam Jet Ejector; f, Clarifying Tank; g, Pump; h, Condenser.

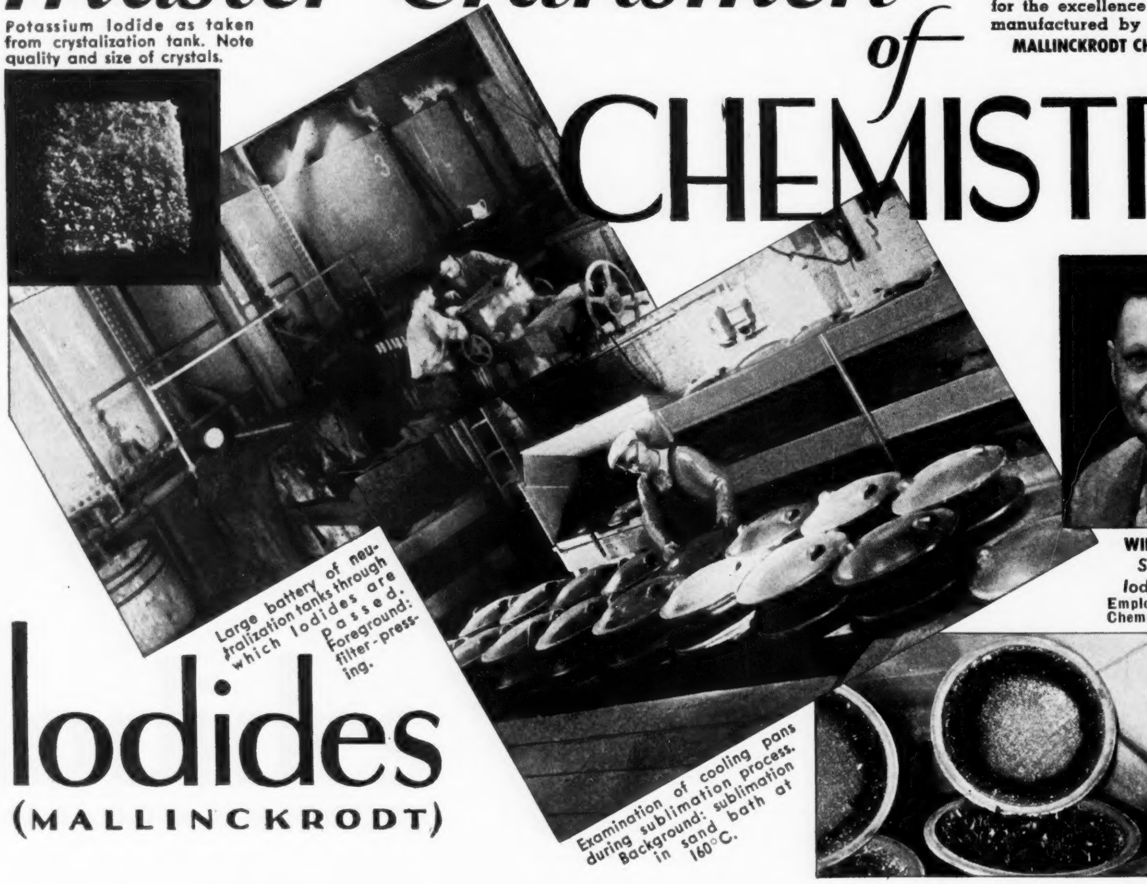
Many products are now sold in the individual crystal form. In the case of sodium sulfite and hypo, for example, the user has learned to associate the regular crystalline quality with purity and good working properties, with the result that such qualities usually command a higher price. There is no doubt whatever that substances which are crystallized in the individual crystal form are usually of astonishing purity, even when derived from mother liquor containing other materials. So far as this country is concerned these products are usually manufactured in rocking crystallizers of the open or of the vacuum type. While in the case of many materials the correct operating conditions are not easy to find, once the conditions have been established the rocking plants are practically automatic and very beautiful products can be obtained continuously and more cheaply than with stationary crystallizers. In America considerable progress has been made with a water-cooled plant of the spiral conveyor type. In the case of the Oslo crystallizer, crystallization is effected by circulating liquor upwards through a bed of crystals, a cooling or evaporating device being provided in the liquor circuit.

Variation In Types of Equipment

While there is, apparently, a very great difference between these types of equipment, principles which govern the production of individual crystals must of necessity be the same, and most of the statements claiming special advantages for one particular type are based upon a wrong interpretation of the basic principles. Since every substance possesses a definite rate of deposition per unit area of crystal surface from a metastable solution under specified conditions of temperature and concentration, it is clear that the output per unit volume of crystallizer capacity must of necessity be the same, no matter

Master Craftsmen of CHEMISTRY

No. 2 of a SERIES
of advertisements portraying the men and the methods responsible for the excellence of the products manufactured by
MALLINCKRODT CHEMICAL WORKS



Potassium Iodide as taken from crystalization tank. Note quality and size of crystals.

Large battery of neutralization tanks through which Iodides are passed. Foreground: filter-pressing.

Examination of cooling pans during sublimation process. Background: sublimation in sand bath at 160°C.

WILLIAM SCHLECHTE
Superintendent
Iodides Production
Employed by Mallinckrodt Chemical Works, September 1900. For over 30 years Mr. Schlechte has devoted himself exclusively to the production of Iodine and Iodides.
"THE SCHOOL OF EXPERIENCE TRAINS MEN TO BE MASTERS."

Resublimed iodine. Pure Resublimed Iodine Crystals on cover. Impurities remain in pan.

Iodides
(MALLINCKRODT)

THE production of superlatively fine chemicals — the supervision of the various processes through which definite chemical structure, freedom from impurities, highest possible degree of stability and uniformly excellent physical characteristics are assured — calls for highly specialized knowledge and skill that can be acquired only through long experience and practice.

In the Mallinckrodt plant, processes, perfected over a period of over 68 years, are supervised by men who have specialized in their particular line of work for many years. Such are the Mallinckrodt Master Craftsmen of Chemistry.

In the manufacture of the Mallinckrodt Iodides, each step, from the process of re-subliming the crude iodine, throughout the processes of combining, neutralization, separation, filtration, to the final crystalization, granulation or reduction to powder, each step is personally supervised by a craftsman of long experience, checked and re-checked against the most rigid laboratory standards. Mallinckrodt Iodides are uniformly as perfect as skill, experience and scientific chemical engineering can make them.

OTHER MALLINCKRODT IODIDES—
Ammonium—Barium—Bismuth (Sub-iodide)—Cadmium—Copper (Cuprous)—Iron (Ferrous)—Lead (N.F.)—Lithium—Magnesium—Manganese—Mercury (Red and Yellow)—Sodium—Strontium—Zinc, and Iodine, (Resublimed).

POTASSIUM IODIDE (M.C.W.)
Mallinckrodt

Mallinckrodt Potassium Iodide, for example, is known wherever chemicals are employed, as a product of the highest degree of excellence. It contains not less than 99.5% of K.I. Its chlorine, bromine and alkali contents are lower than even the U.S.P. requirements. Free from iodate. Free from foreign odors. Impervious to ordinary actinism. Stable to the highest attainable degree. Low in water content. Free from iron, heavy metals. Mallinckrodt Potassium Iodide is available in U.S.P. Crystals — U.S.P. Granulated — U.S.P. Powdered for medicinal and industrial uses — A.R. Crystals and Granulated and Neutral. Granulated for laboratory and analytical work.

ST. LOUIS
CHICAGO
PHILADELPHIA

Mallinckrodt
CHEMICAL WORKS

NEW YORK
MONTREAL
TORONTO

MAKERS OF OVER 1500 FINE CHEMICALS

what type of crystallizer be used, provided that the average size of crystal product is also the same. The smaller the crystals the larger will be the amount of crystal surface available for growth per unit volume of apparatus capacity, or in other words: the output per unit volume of crystallizer capacity will be a product of the rate of crystal growth and the amount of crystal surface available for growth per unit volume. Any attempts to drive the output beyond the value given by this product will result in the production of unstable conditions, whereby spontaneous formation of fresh nuclei will occur and the average crystal size will fall. The adjustment of crystal size will, therefore, take place automatically.

In practice, nucleus formation also takes place by attrition of the crystal charge so that even when plants are operated at considerably lower intensities than the theoretical limit, and the solution is maintained in the metastable state, continuous formation of nuclei will take place and the crystals will not, under practical conditions, increase beyond a certain average size. For special purposes, however, crystallizing plants can now be built in which nucleus formation can be controlled.

While, in general, the results of theoretical calculation correspond very closely with practical outputs, some astonishingly high intensities have from time to time been reported, *i.e.*, outputs per unit volume far in excess of the theoretical limit. An examination of the crystals produced under these high intensity conditions leads to the view, however, that they are not regularly grown from metastable solution, and at the highest intensities a formation of granular agglomerates can take place. This process of separation appears to consist in crystallization from unstable solution followed by granulation, and while in some cases this will yield a product of uniform size, the purity would not compare with the products obtained by controlled crystallization.—Hugh Griffiths, British *Chemical Age*.

Heavy Chemicals

New Method of Producing Hydrocyanic Acid

Hydrocyanic acid by a new catalytic-oxidation production process was described by a Dr. N. Andrussow, Ludwigshafen, before 48th meeting of the Verein Deutscher Chemiker held at Konigsberg, July 2-7. Mixtures of ammonia, methane, and air, within certain fixed limits of composition, passed through a platinum mesh at 1000° C., produce prussic acid rather than nitric oxides. Author suggests probable reaction is:

$$NH_3 + CH_4 + 1.5\,O_2 = HCN + 3H_2O.$$

Oxidation of Methanol to Formaldehyde

Russian chemist reports that in the catalytic oxidation of methyl alcohol to formaldehyde the concentration of the oxygen is the important factor. Best results were obtained with 50—54% of the theoretical quantity of oxygen. Using a copper wire mesh catalyst, yield of formaldehyde obtained corresponded to 87—88% of the methyl alcohol entering into reaction. Loss of alcohol by secondary reactions was only 7—8%.

Under conditions indicated, yield of formaldehyde was found to increase to 92% when the catalyst was silvered. Using silver deposited on pumice as catalyst, yield of formaldehyde was 90%. In the above experiments velocity of the gas current was 1.6 to 1.8 liters per minute. By lowering this velocity to 1.2 to 1.3, and preheating reaction mixture to 360° C., yield of formaldehyde was 92.7% to 93.2%, employing a copper mesh catalyst and 52—57% of the theoretical concentration of oxygen.

With higher concentrations of oxygen there was found thermal decomposition of the formaldehyde. When the oxygen content of the reaction mixture was 110% of the theoretical, for instance, yield of formaldehyde was only 57%. Low concentrations of oxygen seems to be the factor mainly conducive to the production of carbon dioxide from the methyl alcohol.

Russian chemists report that the activity of the vanadium catalyst is largely influenced by the nature of the support, and find that the best results are obtained with manganese dioxide. By using this support, however, it is necessary to work the process at 550° C. instead of the 450° C. generally employed, if the best results are to be obtained. Manner in which the vanadic oxide is deposited on the surface of the support is also an important factor. It has been found that on all supports except quartz, deposition of the vanadic anhydride by precipitation from colloidal solution by means of hydrochloric acid gives better results than coagulation by ebullition.

Trials with certain activating agents have shown copper sulfate to be highly active when the support for the catalyst is manganese dioxide, kieselguhr, porcelain, or asbestos, but when the support is glass, sand, or quartz, copper sulfate is a retardant instead of an activator. Ferric sulfate is a less effective activator than copper sulfate, except when asbestos is the support. Barium chloride is found to be the most efficient activator when the support is sand, glass, or quartz. Alum increases very markedly the catalytic effect of vanadium oxide deposited on manganese dioxide. It is also fairly efficient on a glass support.—Kharmadarian & Brodovitch, *Journal Prikl Khim*, '34, 7, p725.

Chemical Lime Discussed

Author discusses ways in which lime manufacturers, by cooperating with present and prospective customers, can solve some of the many problems that stand in the way of an expansion of the market for chemical lime. "Wanted—A 'New Deal' for Lime Consumers," by Sidney P. Armsby, *Pit & Quarry*, Sept., p28.

Carbon Bisulfide Production

According to U. S. Patent 1,992,832 an improved method of carbon bisulfide production depends upon the use of a carbon containing as catalyst compounds of sodium, potassium, lithium, calcium, barium, strontium or magnesium, or mixtures of these compounds. Mixtures are made of wood carbons, gasoline, asphalt, coal-tar or coal-tar pitch with hydroxides of the alkalis or alkaline earths either molten or in solution. Mixture is heated to 300° to 350° C. and then completely carbonized; temperature of carbonization should be raised to 700° to 900° C. if the original materials are solid, and to 500° to 600° C. if they are liquid. An example specifies the use of 10 to 50 parts of wood carbon, and 20 to 25 parts of tar, or 10 to 12 parts of pitch, with 1 part of catalyst. Content in catalyst of the final porous carbon should be between 3 to 12%.

Coal-Tar Chemicals

Benzaldehyde From Toluol

Direct production of benzaldehyde from toluol by oxidation is effected by means of hydrated manganese dioxide in the presence of sulfuric. By effecting the reaction over 6 hours at a temperature of 35° to 40° C., in the presence of 65% sulfuric, benzaldehyde is the sole product of oxidation. Proportion of acid should be 4 parts and of manganese dioxide one part, in relation to the toluol employed. The yield of benzaldehyde is 20 to 22% of the weight of toluol introduced to process. About 40% of toluol is recovered, however, so that the yield of benzaldehyde on the toluol undergoing actual reaction is 40%. By operating at 75° C. for 17 to 18 hours, and with sulfuric of 50% strength, benzaldehyde and benzoic acid are simultaneously produced. In this case, 13 to 15 parts of acid and 3 parts of manganese dioxide should be used per part of toluol. Yield in aldehyde and acid is 60% on the toluol undergoing reaction.—Berkenheim, Worskaia, Albetskaia, and Dankova, *Journal Prik. Khim*, '34, 7, p779.

Plant Operation

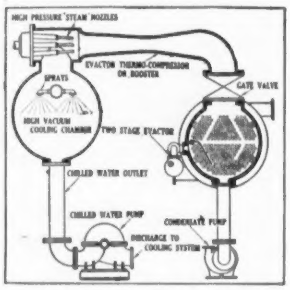
Methyl Bromide For Laboratory Fires

Use of carbon tetrachloride for extinguishing laboratory fires in European countries is giving away to methyl bromide, the British *Chemical Age* reports. This substance boils at 4.5° C., it produces 1.6 times as much gas as CCl_4 and is at least 6 times as effective as the latter. Ease with which CH_3 Br volatizes and the volume of the gas formed are not, in themselves, sufficient to explain its superiority. It has been shown that it, or rather its bromide radical, has a direct inhibiting effect on combustion.

Plant Equipment

Vacuum Method of Refrigeration

Steam is turned to ice in a fraction of a second by the vacuum method of refrigeration, the latest developments in which were described to the A. C. S. members at the recent San Francisco meeting by D. H. Jackson of the Croll-Reynolds Co., one of the several manufacturers who have been carrying on research in this process simultaneously.



Graphic picture of how steam is turned to ice.

Interesting scientific features are involved in the process, which has widespread industrial and domestic applications. In order to produce the high vacuum necessary, live steam flows through small jets at extremely high velocity into a condenser. As the steam expands coming from the jets, it cools down instantaneously, first causing a small portion of it to condense to water and then immediately to freeze into ice.

The steam jets are only a few inches long and the velocity through them runs as high as 4,000 ft. per second. Considering the high velocity and the fact that the temperature of the steam entering the jets is well above the ordinary boiling point, the formation of small ice crystals in the discharge and ice cycles on the end of the jets sounds unbelievable. While it is an accomplished fact, the scientific reasons have not yet been fully explained in all of their details.

The manufacture of ice by the process does not appear to be commercially practical at this time, as production costs are too high, but for intermediate chilling temperatures the process offers definite savings in operating costs. Since its recent commercial development, it has been extensively applied for producing chilled water used in air conditioning of railroad cars, restaurants, theatres, etc.

When first developed, the process required high pressure steam from industrial boilers. Recent improvements include adapting it for low pressure steam available from small heating boilers.

Industrial applications of the process are numerous, including chilling of yeast cultures and wort in breweries, mash and whiskey in distilleries, fruit and vegetable juices in canning plants, various chemical solutions, oils, milk, etc.

Design of Chemical Buildings

Although the chemical process determines the contour of the enclosure, nevertheless, the actual design of the building proper is as important as the design of the process itself. The chemical industry is so young and unsettled that buildings cannot be designed with the expectation that the process will remain unchanged for the normal life of the structure. Consequently, the foundation and structural steel frame should be designed with liberal allowance for unforeseen floor loads, shifting of equipment, and expansion in various directions. With preference given to materials that are long-lived and highly resistant to the moisture and acid condition present, due consideration should be accorded those materials that can readily be replaced and that, up to the point of failure, are accessible for maintenance and painting and do not allow hidden deterioration.—Hurbrts Jacoby, *Ind. Eng. Chem.*, Sept., p999.

Petroleum Chemicals

Synthetic Fatty Acids From Paraffin

Russian chemists are having a certain degree of success in attempting to produce synthetic fatty acids from paraffin. Oxidation in air methods employed by Petrow and Warmalow, working at Kazan, and reported in the August number of L'Industries Chimique, are described as follows: The reaction is slow. It can be accelerated by working under pressure, but this particular solution of the problem has been abandoned as uneconomic. Blowing air for 3 to 4 hours into crude paraffin at atmospheric pressure at a temperature of 160° to 170° C. has been found to give a yield of 50% of fatty acids. It is essential to extract the oxidized material continuously, so as to avoid excessive production of oxy-acids. Under the best conditions, however, the final product contains 10 to 12% of these oxy-acids, which are useless in the production of soaps.

Petrow has also worked on sulfonated mineral oils, which he has heated in a current of air at 90° to 150° C. in the presence of soluble metal salts such as managanese and calcium naphthenates. The oxidation product, in this instance, is neutralized with an alkaline lye, and the soap solution obtained is split by sulfuric acid. Yield of synthetic acids by this process has not so far exceeded 20%, half of these acids being oxy-acids. Most recent work on sulfonated mineral oils has been by employing a pressure of 3 to 4 atmospheres, and a duration of oxidation at 112° to 114° C. of 8 hours. This modification has slightly increased the yield of total acids and diminished the proportion of oxy-acids.

Different methods have been tried out for the separation of the oxidized material from the unaltered paraffinic oil. It has been found that the quantity of benzine necessary for the extraction can be considerably reduced by the use of absorbents. The most recent researches carried out at Gorki have shown that the unsaponifiable matter can be separated quite satisfactorily from soap solutions at a temperature slightly above 80° C. Trials on the manufacture of soaps from synthetic acids have not as yet been crowned with complete success.

Fine Chemicals

Production of Levulinic Acid

Levulinic acid esters can be produced from carbohydrates (saccharose or fructose) by treating in an autoclave for several hours with alcoholic hydrochloric acid. Crude product in the form of a viscous brown liquid is extracted with ether to isolate an oil which is eventually distilled in vacuum. With methyl alcohol, a good yield of ester was obtained, but less satisfactory results were obtained with isopropyl or butyl alcohol.—Weidenhagen and Korotkyi, *Z. Wirtsch, Zuckerind.*, 1935, p131, and reported in British *Chemical Age*, Sept. 7, p219.

Benzophenone From Diphenylmethane

Benzophenone can be formed, according to a Russian patent, 38,634, by the catalytic oxidation of diphenylmethane with dilute nitric, using lead acetate as a catalyst.

A New Alcohol

A new crystalline alcohol of high molecular weight, perrilol, has been isolated from the leaves of the Chinese perilla plant (*Perilla Nankinensis*) in a yield of 0.14 per cent. It melts at 271° C. and crystallizes in colorless needles. *J. Chinese Chem. Soc.*, 3, 315.—Reported by British *Chemical Age.*

Preservatives For Hydrogen Peroxide

According to French chemists best preservative for hydrogen peroxide solution is phenetidine lactate in the proportion of 0.5 grams per liter of solution. Less effective are glucose, gelatine (0.2 grams per liter); ethyl alcohol (16 grams per liter); and hippuric acid (0.2%).

Camphor Extraction

Camphor extracted from the absinthe plant found in Russia, *Artemisia astrachanica*, is remarkable in exhibiting laevo-rotation, since all previously isolated natural camphors have been found to be dextro-rotatory. Method of extraction is outlined by T. A. Sokolova in *Plast. Massy*, Sept.-October, '34.—Reported by British *Chemical Age.*

Radium From Petroleum Waste Liquors.

Expedition sent to the island of Czeleken by the Moscow Institute of Rare Metals reports process for extracting radium salts from petroleum waste liquors.

Lactic Acid From Potatoes

A Hungarian plant at Budafok will produce lactic acid from raw potatoes.

Explosives

New Manufacturing Methods

In the manufacture of nitroglycerine, nitroglycol, and similar esters by nitration with mixed acids in a discontinuous manner, acid liquid becomes altered in composition as the charge of raw material is introduced, and there is a consequent loss in yield since the modified acid has a greater decomposing effect upon the product than the acid originally used. In process, however, in which the nitration is conducted in a continuous manner, the nitration is effected in a single vessel, so that during substantially the whole period for which the nitric ester is present in the reaction vessel, it is in contact with an acid corresponding in composition to the final waste acid. In continuous processes of this nature, therefore, losses in yield occur due to the decomposing effect of the acid.

Object of a recent invention of Imperial Chemical Industries, Ltd., is to provide a process for the production of liquid nitric esters, in which process losses due to decomposition of the nitric ester by the waste acid are minimized.

Invention (E.P. 432,488, accepted July 22, 1935) consists in a continuous process for the production of liquid nitric esters by the nitration of a polyhydric alcohol or a mixture of such alcohols in a series of reaction vessels, according to which a proportion of the polyhydric alcohol is added to each of the vessels and the whole of a suitable quantity of nitrating acid is added to the first vessel only of the series, reaction products from each vessel of the series being passed in succession through each of the following vessels, and the proportion of polyhydric alcohol added to the first vessel being insufficient to produce an acid composition having a deleterious effect upon the nitric ester in contact therewith. In the second and succeeding vessels intensive cooling means are provided, so that the deleterious effect of the waste acid is minimized.

Process may, according to the specification, be carried out in apparatus consisting of a number of separate vessels, or in a number of compartments of a single vessel, or in a combination of separate and compartmented vessels. The vessels may be of known type suitably constructed, for example, in lead or steel, and are cooled by circulation of a cooling medium through internal coils and/or a cooling jacket. Contents of each vessel are stirred by compressed air or mechanical means. Means are preferably provided for determining the temperature of the contents in each vessel. Preferably, also, outlets are provided for drowning the charge from each vessel separately in case of emergency.

Invention is illustrated by the following example: 510 lb. of a mixed acid containing 56.9% sulfuric acid, 42.6% nitric, and 0.5% water were added to a nitrating vessel provided with cooling coils, and were cooled to 7° C. 87 lb. of dynamite glycerine (98.5% glycerol) were gradually added, temperature of nitration being kept constant at 7° C. Total time of nitration was 14½ minutes, and at the conclusion of the nitration 5 lb. of glycerine and 29.3 lb. of mixed acid per minute were added continuously to the vessel, and a corresponding quantity of emulsion run off by overflow to a subsidiary nitrating vessel of a capacity corresponding to approximately 120 lb. of emulsion. The 34.3 lb. of emulsion received per minute from the main nitrator were circulated in this vessel, and an additional 1 lb. of glycerine per minute was run in. Cooling arrangements were such that the temperature of nitration remained at 7° C. Overflow from the second vessel was then passed to a continuous separator. As the capacity of the first vessel corresponded to 597 lb. of emulsion, and the total inflow and outflow were each 34.3 lb. per minute, the average time of contact of the nitroglycerine with the acid in the vessel was 17.4 minutes. Similarly, the capacity and the rates of inflow and outflow for the second vessel were 120 lb. and 35.3 lb per minute respectively, the average time of contact being 3½ minutes. The final waste acid contained 2.88 parts of nitroglycerine per 100 parts of an aqueous acid mixture, consisting of 80% sulfuric acid, 3% nitric acid, and 17% of water. Yield of nitroglycerine expressed in the manner customary in this art was 231% calculated on the glycerine.—British *Chemical Trade Journal*, Sept. 6, p194.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Coal. "Which Coal? The Coal that Makes the Cheapest Steam," by Chester Reed Earle. How to select the coal which on burning gives cheapest steam. *The Paper Industry*, September, p397.

Cotton. "New Domestic Uses for Cotton," by Carl B. Fritsche, Managing Director, Farm Chemurgic Council, Dearborn, Mich. The present situation in domestic cotton textile trade and review of the Farm Chemurgic Council's work to provide new outlets for the product. *Manufacturers Record*, September, p26.

Fine Chemicals. "The Chemistry and Pharmacology of Acetylsalicylic Acid and Its Salts," by Myer Coplans and Arthur G. Green. *Chemistry & Industry*, September 6th, p805.

Food Preservation. "Chemical Aspects of Food Preservation," points from the annual report of the Food Investigation Board (British), a review appearing in *The Chemical Age*, August 24, p161.

Fuels. "300 Years of American Fuels," by A. C. Fieldner. Past, present and future in the U. S. fuel industries. *Ind. & Eng. Chemistry*, September, p983.

Fumigants. "Determination of Fumigants. I. Residual Hydrogen Cyanide in Stored Products (Cacao, Wheat, Tobacco, etc.)," by O. F. Lubatti. Thorough, valuable article. *Journal of the Society of Chemical Industry*, August 23, p275T.

Glue. "Animal and Fish Glues," by Fred Holt, Jr. History, chemical makeup, methods of manufacture, testing methods, and a variety of applications for glue are discussed in this authoritative paper. *The Paper Industry*, September, p410.

Gum Arabic. "Gum Arabic, Its Origin, Gathering, and Marketing," edited by Harry G. Kelbly. *The Drug and Cosmetic Industry*, September, p403.

Ink. "Iron Gallotannate Inks," by Dr. Hans Schweitzer. Recent researches by the writer. *Chemistry & Industry* (British), August 23, p767.

Paint. "Paint Can Be Made to Do More Than Please the Eye in the Oil Industry," by G. A. Menz, Sherwin-Williams. Paint uses in the oil industry are a revelation of ingenuity. An article touched with the romance of chemical progress. *The Oil & Gas Journal*, August 29, p47.

Paint. "Petroleum Derivatives in the Paint and Varnish Industry," by C. C. Gray. First part of this discussion deals with asphaltic bitumens, light colored bitumens, special boiling-point spirits, seed oils, lacquer dilutents, naphthenic acids, and carbon black in their applications to the paint and varnish industry. *The Petroleum Times*, August 17, p187.

Petroleum Refining. "Newer Chemicals in the Petroleum Refinery," by H. H. Moor. Recent developments in use of organic chemicals. *Canadian Chemistry & Metallurgy*, August, p211.

New Equipment

Automatic Repeat Operations QC 283

A new series of time controls has been placed on the market recently, designed to repeat one or 2 operations or processes as often as desired. Provision has been made for exceedingly flexible choice of periods during which the controlled actions take place. Time controls in this series will handle a repetitive action, or operation, requiring a definite time period or cycle with either the same or different time periods between successive time cycles. Parts are so grouped on chassis that adjustment is simple; jack connections permit removal of parts without disturbing wiring.

Rubber Lining For Metal Tanks QC 284

Announcement has been made of a new rubber lining for metal tanks termed "Plioweld," which protects tanks against the action of acids and corrosive liquids. Important in the new development is the fact that the adhesive with which Plioweld is applied to tanks is a rubber derivative, applied to the clean metal which actually welds the resilient rubber to the metal during the process of vulcanization. Adhesive itself is a corrosion resistant material affording added protection in the application.

Shaker Screen With Novel Features QC 285

Several new claims are made for the design of a new shaker screen. This operates in an all-welded steel frame which comes ready to install. It is operated by means of a drive shaft on one end of which is an eccentric mechanism. This transmits an up-and-down motion to a lever connected to a horizontal shaft. On this shaft arms are attached which are connected to the upper and lower decks of the screen at each side and which impart a forward and upward thrust to the decks. Provisions are made for the adjustment of the throw to any degree and three adjustments in length of stroke are available.

Because of the directly opposed motion of the upper and lower decks vibration is kept to a minimum. Because of the comparatively slow speed of this screen the power requirement is low. In one installation a 4-deck 3 by 7-ft. screen is being operated at a capacity by a 2-hp. motor. Accurate grading combined with high production is claimed for this screen and it is said that the sand screens will not blind.

New Steam Traps QC 286

Two new models of steam traps have just been introduced. One style with a union connection and of bronze construction, is adaptable for use on unit heaters, and small steam heated industrial units on process work.

Blast Cleaning Without Compressed Air QC 287

Announcement has just been made of a new blast cleaning machine adaptable to all types of work that entirely eliminates the need for compressed air as the abrasive driving agent. Instead, a rapidly spinning wheel, securely journaled in extra large ball bearings, propels the abrasive by controlled centrifugal force.

Useful Pump For Chemical Plants QC 288

A pump that was primarily designed for pumping water in rock gardens is finding wide application in the chemical and process fields for such widely diversified uses as forcing boiler compounds into boilers, in breweries for use with beer coil cleaning machines, etc. It is self-priming and has only one moving part. Very economical to operate.

Determining "Whiteness" QC 289

A new photo electric reflection meter is designed for the objective determination of whiteness. Instrument consists of a newly designed self-generating photo-electric cell, a micro-ammeter, small Edison storage battery, volt-meter and 2 rheostats, one to control the potential of the light source and the other to vary the resistance of the micro-ammeter. Is of interest not only to the lime industry, but to any field where it is necessary to determine relative whiteness of any product.

New Cutting Barrel QC 290

A triple-action cutting barrel suitable for wet or dry grinding, pulverizing or mixing is announced. Rotation of the barrel is said to impart a tumbling action to the material within it and the inside of the barrel is constructed to produce a rapid flowing motion. Features include self-aligning Hyatt roller bearings, roller chain drive running in oil bath, and special belt shifter which locks "on" and "off." Body castings are made of a special alloy said to insure long life.

Small Size Emulsifier QC 291

One of the large manufacturers of mixing equipment is now marketing a small size emulsifier with interesting construction features. Outfit consists of a vertical cylinder containing a series of perforated baffles with saw-tooth perforated propellor blade mounted between them on a central top driven shaft. Phases come in at the bottom and are subjected to violent turbulence as the emulsion travels upward to the discharge spout. Cominbation of high speed, perforated propellor blades and baffles give a thorough mix. Company claims a minimum of wear and power consumption.

Applying Refractories QC 292

A gun has been perfected for the scientific mechanical application of refractories in plastic form. With this gun, it is said, it is possible to fill cracks or holes, restore burned-out walls, surface new walls or resurface old ones, repair leaky baffles and build new monolithic baffles that are air and gas-tight.

Laboratory Crushers QC 293

A mid-west manufacturer of pulverizing equipment announces a series of laboratory crushers which can be used for a large variety of materials and are sold on a guaranteed basis.

Bottle Cleaning QC 294

A new bottle cleaner, semi-automatic and low in price, specially designed for small production or short runs, is now available. It is said that one operator can clean up to 50 containers per minute.

Air and Gas Mixer QC 295

A new proportional mixer of gas and air permits close control of atmosphere for combustion efficiency.

Controlling Paint Consumption QC 296

A new automatic control regulator has been designed which permits very accurate control over paint consumption in spray systems.

Testing Pliability QC 297

Providing a means of checking and controlling quantitative and qualitative factors relating to the pliability of textiles, thin papers, transparent wrappings, suede leather, and other light materials, a Pliability Comparator has been announced.

Checking Plant Illumination QC 298

You can make an illumination analysis of your plant now easily and quickly with a new instrument that is now available.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 283	QC 291
" 284	" 292
" 285	" 293
" 286	" 294
" 287	" 295
" 288	" 296
" 289	" 297
" 290	" 298

Name ....

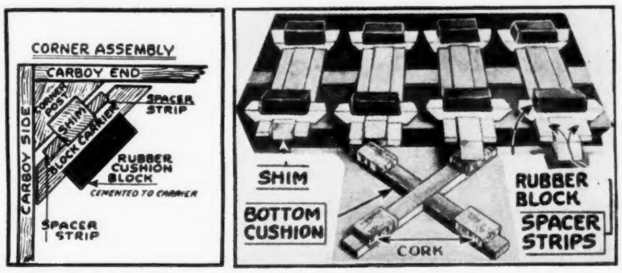
Title ....

Address ....

Packaging, Handling and Shipping

¶ American Cyanamid's Packaging Experts Develop A New Container In Carboys—Lea Manufacturing Offers A New Device For Emptying Carboys—Preparing Box Cars For Loading With the Use of Car Liners—Other Notes—

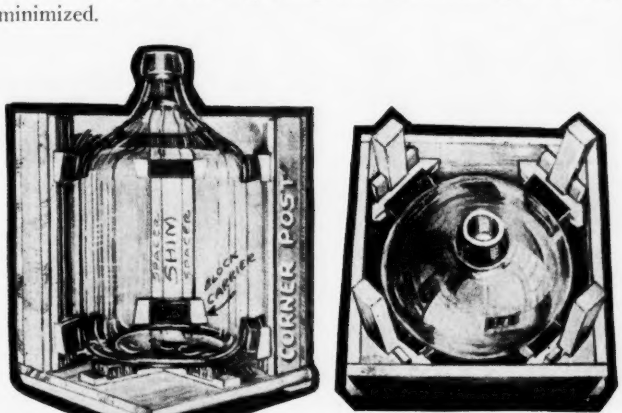
After 4 years of developing and testing, the packaging department of the American Cyanamid Co., under the direction of R. W. Lubey, have perfected a new carboy and method of packing, and covering patents are pending.



The diagram at the left and the photograph of the assembly at the right give an excellent picture of the new features of the Cyanamid container.

Several definite advantages not generally found in carboy construction are offered in this new type of container, and the more important can be summarized briefly as follows:

1. Rubber blocks (8 to each box) provide safe cushioning for the bottle, reducing the rebound from shock (which in the past has been responsible for a large amount of breakage).
2. Changes in temperature will not affect the cushioning nor change the rebound qualities of the rubber cushion blocks.
3. The application of pressure and the location of the cushions on the bottles are automatically adjusted by the insertion of the shims in grooves in the corner posts and cushion frames. Human error in packing and reconditioning is thereby minimized.



Two additional views of the Cyanamid carboy container, a real contribution in packaging

4. The cushions suspend the bottles at the strongest points—the curves of the upper and lower shoulders.
5. The unusual design allows a safe rocking movement of the bottle. The cushion frame and shim which allow this movement are designed to prevent the bottle from coming in contact with the sides of the box.
6. The rugged construction of the box and corner cushion frames and the indestructible quality of the rubber cushion blocks (the blocks can be reclaimed and used indefinitely), insure safe transportation and a saving in packaging costs that shippers will appreciate.

Safe Emptying of Carboys

The Lea Mfg. Co., Waterbury, Conn., are the sole distributors of a new ejector—a safety device for emptying acids or other liquids from carboys. This ejector does away with blocks, cradles, tilters and other similar devices. It operates to prevent broken carboys, nicks in the glass and other injury to the acid containers. Indoor storage is easy and injury to floors is also prevented.

Use of Car Liners

It is quite often considerable of a problem, where products are shipped by rail, to insure that they will reach their destination free from dirt and from moisture. There is always the possibility of a leaky car roof, and unless the product is such that it can be supplied with a water-proof package of its own, damage is sure to result.

Partly because of this, and partly because of the good psychological effect in giving the impression of care in shipments, quite a number of shippers are resorting to the use of box car liners, made of heavy waterproof kraft paper. Ceiling application of the paper is such that it rises to a peak in the center, in conformity with the car roof, and thus any water leaking through the roof at any point is carried over and down behind the liner on the side wall. A car that is fitted out with a set of these paper liners not only guarantees clean dry delivery, safeguarding against damage claims, but it also makes a very favorable impression on the firm to which the goods are shipped, and is thus a splendid factor for influencing repeat business.—John E. Hyler, *Packing & Shipping*, Sept., p16.

Packaging Notes

Use of Color Explained

"Color in Modern Packaging," by Faber Birren (Crimson Press, 919 N. Michigan ave., Chicago, $1) is a sprightly discussion of color harmony principles rather than laws that affect the efforts of packaging artists. Those interested in packaged chemical specialties will find the booklet a pleasing textbook to read and to refer to.

Bemis Bag Moves

Bemis Bag moves its general sales department office, Chicago sales office, and traffic department to 309 W. Jackson Blvd., Chicago.

U. S. Chemical Patents

A Complete Check-List of Products, Apparatus, Equipment, Processes

Agricultural Chemicals

Production parasiticidal and insecticidal emulsion spray by dispersing oil in water with an ammonia soap. No. 2,012,328. William Hunter Volck, Watsonville, Cal., to California Spray-Chemical Corp., Berkeley, Cal.

Production insecticidal oil of relatively non-volatile petroleum oil, insecticidal material, and non-volatile highly halogenated hydrocarbon. No. 2,013,028. Hyym E. Buc., Roselle, N. J., to Standard Oil Development Co., a corp. of Del.

Protecting plants from dessication using aqueous wax emulsion containing colloidal earth. No. 2,013,063. Elroy J. Miller to the Michigan State Board of Agriculture, both of East Lansing, Mich.

Production spray composition of water, iron salts, clay, and refined mineral oil, all in form of stable emulsion forming quicking breaking emulsion upon spraying. No. 2,013,272. Maxwell O. Johnson, Wahiawa, Territory of Hawaii.

Production colloidal suspensions suitable for insecticides comprising insoluble complex fluoride, sulfite lye, and a barium salt. No. 2,014,139. Ernest Charles Large, North Acton, London, England, to Electro Chemical Processes Ltd., London, England.

Cellulose

Dyeing cellulose esters and ethers using diazo forming amino compounds, free from sulfonic acid groups. No. 2,012,553. Erwin Thoma, Frankfort-am-Main-Hochst, Germany, to General Aniline Works, Inc., N. Y. City.

Process fire-proofing cellulosic materials. No. 2,012,686. Martin Leatherman, Hyattsville, Md., dedicated to the free use of the Public of the U. S. A.

Cellulose ether composition containing also a plasticizer, and a thiotriaryl phosphate. No. 2,013,298. Bozetech C. Bren, Cedar Grove, N. J., to du Pont Viscoloid Co., Wilmington, Del.

Difficultly flammable cigarette wrapper using cellulosic material with barium sulfide immersed in zinc sulfate solution to form zinc sulfide. No. 2,013,508. Stewart Elmer Seaman, White Plains, N. Y.

Process making pencil leads using binder of casein, gelatin, glue, water-soluble cellulose group and hardening with formaldehyde. No. 2,013,584. Erich Schwanhausser, Nuremberg, Germany.

Preserving gel regenerated cellulosic pellicles using aqueous chlorinated cresol and glycerine solution. No. 2,013,739. Henry H. Wright, Snyder, N. Y., to Du Pont Cellophane Co., Inc., N. Y. City.

Hydrolyzing organic acid esters of cellulose. No. 2,013,830. Carl J. Malm and Charles L. Fletcher to Eastman Kodak Co., all of Rochester, N. Y.

Manufacture fiber articles using alkaline liquor to destroy hydrated cellulose. No. 2,013,841. George A. Richter to Brown Co., both of Berlin, N. H.

Process for comminution of cellulose materials using acetic acid. No. 2,014,074. Samuel E. Sheppard and Leon W. Eberlin to Eastman Kodak Co., all of Rochester, N. Y.

Chemical Specialties

Production edible dusting powder for greasy foods using disrupted starch grains, grease, and sweetening agent. No. 2,012,506. Carroll L. Griffith to The Griffith Laboratories, Inc., both of Chicago.

Preparation emulsions of water-in-oil type containing insoluble sulfate ester salt of a normal straight chain primary alcohol. No. 2,012,611. Samuel Lenher and Charles Titus Mentzer, Jr., to E. I. du Pont de Nemours & Co., all of Wilmington, Del.

Production emulsions of water and mineral oil. No. 2,012,612. Samuel Lenher and Charles Titus Mentzer, Jr., to E. I. du Pont de Nemours & Co., all of Wilmington, Del.

Process chemically transforming photographic images. No. 2,013,159. Friedrich Lierg, Dresden, Germany.

Production detergent composition for textile fibers of alkali-sulfo-organic salts and a protective colloid of glue, gelatine, or isinglass type. No. 2,013,300. Charles Dunbar, Middleton, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production dry zinc tungate soap. No. 2,013,667. William J. O'Brien, Shaker Heights, and Gordon H. Mutersbaugh, Rocky River, Ohio, to The Glidden Co., Cleveland, Ohio.

Chill-hardening adhesive comprising 90% rosin and remainder of cottonseed oil. No. 2,013,928. Kent M. Richardson, Winona, Minn., and David J. Harding, Kansas City, Kans., to Industrial Patents Corp., Chicago.

Coatings

Production gas-proof varnish of tung oil, a drier, and a gas checking inhibitor of coal tar derivative type. No. 2,012,279. Julius Hyman to Velsicol Corp., both of Chicago.

Preparation paving mixtures of mineral aggregates coated with bitumen. No. 2,012,496. Charles F. Carroll, Los Angeles, Cal., to American Bitumuls Co., San Francisco.

Production nitrocellulose bronzing lacquer containing gel preventative of lactic acid, its esters, or its salts. No. 2,012,922. Charles Bogin and Vaughn Kelly to Commercial Solvents Corp., all of Terre Haute, Ind.

Saturating fibrous conduits with bituminous saturant in heat liquefied condition. No. 2,012,961. George Emberg, Chicago, to The Barrett Co., N. Y. City.

Protective coating composition of chlorinated rubber and a component of oxidized drying or semi-drying oil. No. 2,013,336. Robert D. Bonney, Glen Ridge, and Walter S. Egge, West Orange, N. J., to Congoleum-Nairn Inc., a corp. of N. Y.

Composition for lining can ends comprising solid body material and solution of latex and fortified ammonium alginate. No. 2,013,670. John E. Robinson, Glen Ellyn, Ill., to American Can Co., N. Y. City.

Production mixed cellulose ester coatings. No. 2,013,825. Charles R. Fordyce, Rochester, N. Y., and James D. Coleman, Jr., Columbus, Ohio, to Eastman Kodak Co., Rochester, N. Y.

Flexible abrasive sheet. No. 2,013,925. Francis G. Okie to Minnesota Mining & Manufacturing Co., both of St. Paul, Minn.

Production bituminous paving composition by mixing fluent bitumen and water to form bitumenous emulsion. No. 2,013,972. Samuel S. Sadtler, Springfield Township, Montgomery County, and Woolsey H. Field, Wyncote, Pa.

Coal Tar Chemicals

Production nitro-aniline by nitrating an acylanilid and heating resulting mixture with sulfuric acid. No. 2,012,307. Lawrence H. Flett, Hamburg, N. Y., to National Aniline & Chemical Co., Inc., N. Y. City.

Production amino-diphenyl derivatives by reacting benzene hydrocarbons with N-halogen-acyl derivatives of nuclear benzene amino compounds. No. 2,012,569. Georg Kranzlein, Paul Ochwat, and Karl Moldaenke, Frankfort-am-Main, Germany, to General Aniline Works, Inc., N. Y. City.

Process preparing diazonium compounds from 4-aminodiarylamines. No. 2,013,180. Wilhelm Koch, Offenbach-am-Main, Germany, to General Aniline Works, Inc., N. Y. City.

Production sulfonic acid and carboxylic acid derivatives of 1,1′-diaryl-3,3′-arylene-5,5′-bis-pyrazolones. No. 2,013,181. Herbert Kracker and Richard Schmid, Frankfort-am-Main, Germany, to General Aniline Works, Inc., N. Y. City.

Production arylamino-hydroxybenzene. No. 2,013,182. Leopold Laska, Oskar Haller, and Arthur Werdermann, Offenbach-am-Main, Germany, to General Aniline Works, Inc, N. Y. City.

Production azabenzanthrone compound. No. 2,013,659. Max Albert Kunz, Mannheim, and Gerd Kochendoerfer and Karl Koeberle, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, Inc., N. Y. City.

Production aromatic amines by reacting phenol vapors, ammonia, and hydrogen gas with a catalyst. No. 2,013,873. Eberhard Vogt, Leuna, Germany, to General Aniline Works, Inc., N. Y. City.

Dyes, Stains, etc.

Production trisazodyestuffs. No. 2,012,387. Eugen Glietenberg and August Sigwart, Leverkusen-I.G.-Werk, Germany, to General Aniline Works, Inc., N. Y. City.

Production vat dyestuffs of dibenzanthrone series. No. 2,012,558. Hugo Wolff, Mannheim, and Walter Meig, Opladen, Germany, to General Aniline Works, Inc., N. Y. City.

Production monoazo dyestuffs. No. 2,012,772. Bernhard Richard to firm J. R. Geigy A. G., both of Basel, Switzerland.

Production chromiferous azo-dyestuff from mixture of chromed azo-dyestuff and chromable azo-dyestuff. No. 2,012,779. Fritz Straub, Basel, and Hermann Schneider, Riehen, near Basel, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production synthetic tans by condensing a sulfonated phenol with formaldehyde in presence ammoniacal base. No. 2,012,928. Franz Hassler, Hamburg-Volksdorf, Germany, to I. G, Frankfort-am-Main, Germany.

Production vat dyestuff of 4′-aroylamino-2-phenyl-anthraquinone. No. 2,012,930. Raymond Joseph Sobatzki, South Milwaukee, Wis., and Oakley Maurice Bishop, deceased, late of Wilmington, Del., by Eva P. Bishop and Wilmington Trust Co., executors, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production azo dye having lactamizable ice-color coupling component in its structure. No. 2,012,991. Samuel Coffey, Huddersfield, and Wilfred Archibald Sexton, Manchester, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production azo dyestuff adapted to dyeing animal and vegetable fiber. No. 2,012,994. Norman Hulton Haddock, Prestwich Park North, Prestwich, and Clifford Paine, Handforth, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production dyestuffs of the oxazine series. No. 2,013,069. Wilhelm Schepss, Leverkusen-I.G.-Werk, Germany, to General Aniline Works, Inc., N. Y. City.

Production organic coloring material of azo compound and oxidized rosin as a substratum. No. 2,013,074. Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.

Production coloring material of organic nature of azo compound with an arylated rosin as substratum. No. 2,013,075. Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.

Production organic coloring material comprising azo compound and chlorinated rosin as substratum. No. 2,013,076. Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.

Production organic coloring material of azo compound and nitro rosin as substratum. No. 2,013,077. Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp, Newark, N. J.

Production organic coloring compounds using azo compounds and sulfonated derivatives of pyrogenic decomposition products of rosin. No. 2,013,084. Edward R. Allen, Summit, Wayne N. Headley, Livingston, and Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.

Production organic coloring compounds comprising azo compounds and hydrogenated rosins. No. 2,013,090. Archibald M. Erskine, Chatham, and Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.

Patents digested include issues of the Patent Gazette, Aug. 27 through Sept. 10 inclusive.

P. Q. SILICATES OF SODA

LET DEPENDABLE SILICATES HELP YOU

P. Q. SILICATES of Soda reduce production costs or improve results in numerous processes throughout industry.

P. Q. Silicate Headquarters can help you find the right grade for your job. As pioneer producers of silicates of soda, our experience has been long, both in making uniformly good quality and in finding profitable ways to use the various grades in industry.

P. Q. pre-tested grades assure uninterrupted performance to meet your own high standards. Thirty-three different silicates for every use and each one dependably made.

PHILADELPHIA QUARTZ COMPANY

General Offices and Laboratory: 125 S. Third St., Philadelphia, Pa. Chicago Sales Office: 205 W. Wacker Drive. Stocks in 65 cities. Sold in Canada by NATIONAL SILICATES LTD., Toronto, Ontario.

PQ REG. U.S. PAT. OFF.

DO THE JOB BETTER OR AT LOWER COST

Production organic coloring material of azo compound and a petroleum sulfonate as the substratum. No. 2,013,091. Archibald M. Erskine, Chatham, and Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.
Production organic coloring material containing azo compound and a naphthenate as substratum. No. 2,013,092. Archibald Mortimer Erskine, Chatham, N. J., to Krebs Pigment & Color Corp., Newark, N. J.
Production organic coloring material of azo compound and natural gums and balsams as substratum. No. 2,013,099. Wayne N. Headley, Livingston, and Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.
Production azo lake or pigment of insoluble azo compound salt, a coupling compound, and substratum of soap of liquid styrax. No. 2,013,-100; Wayne N. Headley, Livingston, and Alfred Siegel, Hillside, N. J., to Krebs Pigment & Color Corp., Newark, N. J.
Production ink consisting of alcohol soluble dye and non-drying oil or fat. No. 2,013,291. Adolf Schubert, Millburn, N. J., to Barrett & Co., Newark, N. J.
Staining fibrous bodies using watery suspension of resin (organic solvent soluble) in a water-soluble dye solution. No. 2,013,329. Lois W. Woodford, N. Y. City, to R. W. Callaway, N. Y. City, and Alan M. Mann, Scarsdale, N. Y., as joint trustees.
Production insoluble azo dyes. No. 2,013,723. Frithjof Zwilgmeyer to E. I. du Pont de Nemours & Co., both of Wilmington, Del.
Production asymmetrical polyazo dye. No. 2,014,143. Eugene A. Markush, Jersey City, N. J., to Pharma-Chemical Corp., N. Y. City.
Production polyazo dyes. No. 2,014,207. Clifford Paine, Handforth, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Explosives

Production liquid explosive composition by conitration of aliphatic alcohol and mononitro derivative of an aromatic hydrocarbon. No. 2,012,-986. James B. Castner, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Fine Chemicals

Production alkylene ester of polybasic acids by reacting glycol with dibasic acid. No. 2,012,267. Wallace H. Carothers to E. I. du Pont de Nemours & Co , both of Wilmington, Del.
Process preparing certain acylcholine esters and their salts. No. 2,012,-268. Joseph K. Cline, Woodbridge, N. J., to Merck & Co., Inc., Rahway, N. J.
Production artificial mass comprising reaction product of a fatty glyceride and a neutral heat hardening condensation product. No. 2,012,-277. Herbert Honel, Klosterneuburg-Weidling, near Vienna, Austria, to Beck, Koller & Co., Inc., Detroit, Mich.
Production condensation product by reacting fatty oil with oil soluble condensation product in absence of unsubstituted phenol. No. 2,012,278. Herbert Honel, Vienna, Austria, to Beck, Koller & Co., Inc., Detroit, Mich.
Production non-crystalline halogenated aromatic ketone. No. 2,012,301. Frank M. Clark and Walter M. Kutz, Pittsfield, Mass., to General Electric Co., a corp. of N. Y.
Production non-crystalline halogenated composition containing phenyl-halogen groups linked to a methane group. No. 2,012,302. Frank M. Clark and Walter M. Kutz, Pittsfield, Mass., to General Electric Co., a corp. of N. Y.
Production butyl amines by reacting butyl alcohol and ammonia over an aluminum silicate catalyst. No. 2,012,333. Herrick Ransom Arnold, Elmhurst, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Production hydroxydiphenylketocarboxylic acid salts of 3-phenyl dihydroquinazolines. No. 2,012,394. Walter Kropp, Elberfeld, Germany, to Winthrop Chemical Co., Inc., N. Y. City.
Production stabilized organo-mercuri-sulfur compounds. No. 2,012,820. Morris S. Kharasch, Chicago, to Eli Lilly & Co., Indianapolis, Ind.
Production organic fluorine compounds by reacting fluorine with organic material in liquid medium inert to fluorine. No. 2,013,030. William Stansfield Calcott and Anthony Francis Benning, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Production fluorine compounds by introducing fluorine over reaction mixture of organic material and liquid reaction medium inert to fluorine. No. 2,013,035. Herbert Wilkens Daudt, Wilmington, Del., and Howard Maurice Parmelee, Salem, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Production aromatic amines by replacing hydroxy radical of phenol with amino radical. No. 2,013,052. George Frederick Horsley, Norton-on-Tees, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.
Production aliphatic halo-fluoro compounds by interacting a metal fluoride other than antimony, aliphatic hydrocarbon halogen derivative other than fluorine, and antimony salt. No. 2,013,062. Thomas Midgley, Jr., Worthington, and Albert L. Henne, Columbus, Ohio, to Frigidaire Corp., Dayton, Ohio.
Production denture of polymerized methyl methacrylate. No. 2,013,295. John James Tidd, Ardrossan, Scotland, to Imperial Chemical Industries Ltd., a corp. of Great Britain.
Process removing quinone, hydroquinone, and red oil from an amino phenol. No. 2,013,394. Alexander V. Tolstoouhov to Ostro Research Laboratories, Inc., both of N. Y. City.
Production acetyl choline acetate. No. 2,013,536. Joseph K. Cline, Woodbridge, N. J., to Merck & Co., Inc., Rahway, N. J.
Production unsaturated monocarboxylic aliphatic acid esters by dehydrohalogenating saturated alphachlormonocarboxylic aliphatic acid ester with ferric chloride. No. 2,013,648. Harold J. Barrett to E. I. du Pont de Nemours & Co., both of Wilmington, Del.
Production algin composition containing latex. No. 2,013,651. Bernard F. Erdahl, Duluth, Minn.
Production fluoroaminoanthraquinone. No. 2,013,657. Frank Willard Johnson, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Production divinyl ether by reacting a symmetrical dihaloethyl ether and an alkali-metal hydroxide in glycol. No. 2,013,662. William A. Lott, Newark, N. J., to E. R. Squibb & Sons, N. Y. City.
Production barbituric acid-hydantoin compound. No. 2,013,717. Simon L. Ruskin to Frances R. Ruskin, both of N. Y. City.
Process producing salts of acetyl-choline by reacting choline salt with glacial acetic acid. No. 2,013,731. Randolph T. Major, Westfield, and Joseph K. Cline, Rahway, N. J., to Merck & Co., Inc., Rahway, N. J.
Bromination of pyranthrone by applying pressure to bromine and pyranthrone in presence of chlorine. No. 2,013,790. John H. Sachs, Wilmington, Del., and Ferdinand W. Peck, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Brominating organic compound forming hydrobromic acid as a by-product. No. 2,013,791. John H. Sachs, Wilmington, Del., and Ferdinand W. Peck, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Glass and Ceramics

Production borosilicate glass composition of silica 72%, magnesia 12%, boric oxide 8%, sodium oxide 6%, and potassium oxide 2%. No. 2,012,-552. William C. Taylor to Corning Glass Works, both of Corning, N. Y.
Heat insulation by mixing zinc, cadmium or the like with glass mass and heating. No. 2,012,617. Carl Georg Munters, Stockholm, Sweden.
Flexible non-resilent mica production using binder of rosin in "Red Engine Oil" as binder to make mica products. No. 2,012,948. Willis A. Boughton, Cambridge, Mass., to New England Mica Co., Waltham, Mass.
Cementitious composition including magnesia, talc, silica sand, and magnesium and barium chloride solution. No. 2,013,132. Leon Louis Cailloux, Montreal, Quebec, Canada.
Production laminated glass using application of amylene dichloride to celluloid laminating sheet. No. 2,013,213. August W. Hornig, Chicago, Ill.
Production laminated glass using water on adhesive surface. No. 2,014,124. Frederic L. Bishop, Fox Chapel Manor, Pittsburgh, Pa., to American Window Glass Co., Pittsburgh, Pa.
Production brown glass batch including small amounts ammonium sulfate and organic matter. No. 2,014,230. Kitsuzo Fuwa and Fujio Suzuki, Tokyo, Japan, to General Electric Co., a corp. of N. Y.
Abrasive wheel of granular crystalline alumina and glass using vulcanized rubber compound joiner. No. 19,678-reissue. Raymond C. Benner and Howard E. Stowell to The Carborundum Co., all of Niagara Falls, N. Y.

Industrial Chemicals, Apparatus, etc.

Production friction lining of fine asbestine and organic binder and free of fibrous material. No. 2,012,259. Harry B. Denman, Pontiac, Mich.
Process hydrogenating carbonaceous materials. No. 2,012,318. Theodor Wilhelm Pfirrmann, Castrop-Rauxel, Germany.
Purification method and apparatus for alcoholic liquors. No. 2,012,365. Arthur M. Werner, St. Louis, Mo.
Production sodium phenyl and its derivatives by reacting sodium and aromatic chloro compound in presence inert organic solvent. No. 2,012,-372. Max Bockmuhl and Gustav Ehrhart, Frankfort-am-Main, Germany, Winthrop Chemical Co., Inc., N. Y. City.
Process making water-soluble fibroin by dispersing anhydrous ammoniacal solution of fibroin and evaporating off ammonia. No. 2,012,382. Heinrich Fink and Ernst Rossner, Premnitz/Westhavelland, Germany, to I. G., Frankfort-am-Main, Germany.
Production monocalcium phosphate by adding phosphoric acid to hydrated lime at temperature above 180°F. No. 2,012,436. Byramji D. Saklatwalla and Holbert Earl Dunn, Crafton, Pa., and Albert E. Marshall, Scarsdale, N. Y., to Southern Mineral Products Corp., N. Y. City.
Sulfurized pine oil for lubricant manufacture by reacting sulfur and pine oil. No. 2,012,446. McKinley C. Edwards, Jackson Heights, N. Y., and Joseph V. Congdon, Medford, Mass., to Socony-Vacuum Oil Co., Inc., N. Y. City.
Process stabilizing peroxide solutions using salt of pyrophosphoric acid and a substituted amine. No. 2,012,462. Carl Alexander Agthe, Zurich, and Rudolf Blaser, Basel, Switzerland, to firm J. R. Geigy A. G., Basel, Switzerland.
Process and apparatus for liquid and solid carbon dioxide production. No. 2,012,587. Franklin B. Hunt to The Liquid Carbonic Corp., both of Chicago, Ill.
Froth flotation process using flotation agent of sulfuric acid ester of normal primary alcohol and a free normal primary alcohol. No. 2,012,-609. Samuel Lenher to E. I. du Pont de Nemours & Co., both of Wilmington, Del.
Production anhydrous ammonia by separation from aqueous ammoniacal solution. No. 2,012,621. James L. Bennett to Hercules Powder Co., both of Wilmington, Del.
Electrically heated cushion using combustible fabric impregnated with solution of ammonium sulfate and chloride, boric acid and borax. No. 2,012,631. Hanna Kindermann and Grete Kindermann, nee Huesmann, Radlitz, Post Steinau, Germany.
Production boiler scale and rust removing composition using juice of henequen plant. No. 2,012,641. Edward Lewis Smead, Mexico, D. F., Mexico.
Refining graphite by digesting concentrated ores with ammonium bisulfate solution. No. 2,012,684. Absalom M. Kennedy, University, Ala., to W. H. Weller, Jr.
Preparation substantially pure tertiary olefines by reacting aliphatic tertiary alcohol with an aqueous acidic compound. No. 2,012,785. Richard M. Deanesly and William Engs, Berkeley, Cal., to Shell Development Co., San Francisco.
Process absorbing isobutylene products in strong sulfuric acid. No. 2,012,787. Hendrik Willem Huyser and Johannes Andreas van Melsen, Amsterdam, Netherlands, to Shell Development Co., San Francisco.
Production alkyl derivatives of ammonia by treating ammonia with primary and secondary amines in presence catalyst. No. 2,012,801. Leonid Andrussow, Mannheim, and Emil Germann, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.
Continuous production of esters from aqueous solutions of aliphatic acids. No. 2,012,812. Henri Martin Guinot, Melle, France, to Commercial Solvents Corp., N. Y. City.
Froth flotation process for concentrating sulfide ores using alkaline solution. No. 2,012,830. Oliver C. Ralston and Clarence R. King, Clarkdale, Ariz., to Phelps Dodge Corp., N. Y. City.
Production caustic liquor by causticization of sodium carbonate with lime. No. 2,012,854. Norman C. Hill, Saltville, Va., to The Mathieson Alkali Works, Inc., N. Y. City.
Process increasing electrical resistance of fused magnesium oxide. No. 2,012,897. Robert J. Sutton, Wooster, Ohio, and Jonathan R. Fritze, Western Springs, Ill., to Edison General Electric Appliance Co., Inc., Chicago.
Production vermiculite-in-oil paste for sealing pistons. No. 2,012,952. Harold S. Brinker and William B. Thomas to Motor Seal Corp., all of Denver, Colo.
Continuous saturation of absorbent articles. No. 2,012,969. Stuart P. Miller, Englewood, N. J., to The Barrett Co., N. Y. City.
Saturation of absorbent conduits. No. 2,012,970. Stuart P. Miller, Englewood, N. J., to The Barrett Co., N. Y. City.
Production nitrated aromatic hydrocarbons by nitrating aromatic hydrocarbon with spent acid. No. 2,012,985. James B. Castner, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Acylating sugars by treating sugar with lower fatty acid anhydride in presence of lower fatty acid salt of alkali metal as catalyst. No. 2,013,034. Gerald J. Cox and John H. Ferguson, Pittsburgh, Pa., to Niacet Chemicals Corp., N. Y. City.

Fluoration of aliphatic halides by reacting pentavalent antimony compound, hydrocarbon derivative containing halogen other than fluorine, and fluorine. No. 2,013,050. Albert L. Henne, Columbus, Ohio, to General Motors Corp., a corp. of Del.

Production hydrogen by hydrocarbon decomposition using precipitated nickel catalyst. No. 2,013,066. Frank Porter, Syracuse, N. Y., to Atmospheric Nitrogen Corp., N. Y. City.

Deodorization of lactates using suspended activated carbon and by gassing with ozone. No. 2,013,082. Charles A. Vana to The Grasselli Chemical Co., both of Cleveland, Ohio.

Purifying partly purified fermentation lactic acid by adding small amount of peroxide compound and heating. No. 2,013,096. Ivan L. Haag, Lakewood, Ohio, to E. I. du Pont de Nemours & Co., Wilmington, Del.

Purification crude lactic acid by treatment with steam and charcoal. No. 2,013,104. Alexander Douglas Macallum, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production carboxylic amides by passing gaseous ammonia through melt of fatty acids in presence surface catalyst. No. 2,013,108. Walter Reppe and Ernst Keyssner, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Method making basic zinc formaldehyde sulfoxylate. No. 2,013,124. Frederick W. Binns, Quincy, Mass., to Virginia Smelting Co., Portland, Me.

Method making alkali-metal formaldehyde sulfoxylate. No. 2,013,125. Frederick W. Binns, Quincy, Mass., to Virginia Smelting Co., Portland, Me.

Purifying and drying of sulfur dioxide burner gases containing hydrofluoric acid using sulfuric acid as contacting agent. No. 2,013,313. Jesse G. Melendy, Tarrytown, N. Y., to General Chemical Co., N. Y. City.

Production esters of dihydric and polyhydric alcohols. No. 2,013,318. Ludwig Rosenstein and Walter J. Hund, San Francisco, Cal.

Production magnesium chloride from calcium chloride. No. 2,013,334. Edwin O. Barstow, Sheldon B. Heath, and Forest R. Minger to The Dow Chemical Co., all of Midland, Mich.

Production carboxylic acids by reacting an olefinic hydrocarbon and formic acid in vapor phase reaction. No. 2,013,338. Gilbert B. Carpenter, Bellemoor, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Construction material of fibrous base saturated with solid bituminous waterproof substance. No. 2,013,349. Lester Kirschbraun, Leonia, N. J., to The Patent and Licensing Corp., Boston, Mass.

Production siding element of asphaltic composition. No. 2,013,351. Harold L. Levin, Rutherford, N. J., to The Patent & Licensing Corp., Boston, Mass.

Process decolorizing alkaline earth sulfates. No. 2,013,401. Harold Simmons Booth, Cleveland Heights, Ohio.

Process recovering salt from salt solutions. No. 2,013,438. Wilhelm Fitz, Essen-Ruhr, Germany, to The Koppers Coke Co. of Del., Pittsburgh.

Production of alcohols from alkylated acids by hydrolysis. No. 2,013,453. Kenneth E. Stuart, Merion, Pa., to Hooker Chemical Co., N. Y. City.

Production abrasive material and bond consisting of resinous condensation product of polyhydric alcohol with polybasic acid and a fatty acid. No. 2,013,496. Georg Kranzlein, Frankfort-am-Main-Hochst, and Richard Karl Muller, Bad Soden-am-Taunus, Germany, to I. G., Frankfort-am-Main, Germany.

Production cresylic acid and its condensation product. No. 2,013,523. Izador J. Novak to Raybestos-Manhattan, Inc., both of Bridgeport, Conn.

Production lead carbonate by atomizing lead in stream of acetic acid vapor, water-vapor, and oxygen, and mixing lead paste with carbon dioxide. No. 2,013,531. Addison Applegate, Liberty, N. Y.

Production non-cementitious surfacing composition of calcium chloride, a dust or flour, and a fibrous material. No. 2,013,558. John P. Floan, Bayside, N. Y., to Chadeloid Chemical Co., N. Y. City.

Production nitrogen and hydrogen by thermal decomposition of ammonia. No. 2,013,652. Cecil Stuart Hall, Norton Hall, The Green, Norton-on-Tees, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production cork composition by treatment with partially condensed phenol-aldehyde resin. No. 2,013,698. Herbert Paschke and Clarence C. Vogt to Armstrong Cork Co., all of Lancaster, Pa.

Production hydrogen and carbon black by mixing hydrocarbon gas with steam and heating. No. 2,013,699. Ralph S. Richardson, Teaneck, N. J., to Chemical Construction Corp., N. Y. City.

Production aromatic alcohols by reacting aromatic benzene with an aliphatic alkylene oxide and an acid. No. 2,013,710. Marion Scott Carpenter, Nutley, N. J., to Givaudan-Delawanna, Inc., N. Y. City.

Production tertiary butyl chloride by reacting tertiary butyl alcohol with hydrochloric acid in presence calcium chloride. No. 2,013,722 Walter V. Wirth, Woodstown, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production alcohol addition products of unsaturated compounds. No. 2,013,725. Wallace H. Carothers, Fairville, Pa., and Ralph A. Jacobson, Ardentown, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production diethyl ethers and their alcohol derivatives. No. 2,013,752. Henry B. Gans, Jr., Uniontown, and Arthur B. Holton, Pittsburgh, Pa.

Purifying sulfur dioxide roaster gases. No. 2,013,753. Carl Hahn, Leverkusen, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture carbon black by burning hydrocarbon gas with oxygen. No. 2,013,774. William Bryan Wiegand, Sound Beach, Conn.

Production carbon black of high color intensity. No. 2,013,775. William Bryan Wiegand, Sound Beach, Conn.

Production pure lecithin by removal of water. No. 2,013,804. Gustav Klien, Mannheim, and Karl Tauboeck, Ludwigshafen-am-Rhine, Germany, to Winthrop Chemical Co., Inc., N. Y. City.

Production nitrogen by decomposition of ammonia. No. 2,013,809. Eric Hall Salisbury, Norton-on-Tees, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production lime composition. No. 2,013,811. Ralph W. Smith, Ste. Genevieve, Mo., to Peerless White Lime Co., St. Louis, Mo.

Production alkali-metal zirconium tartrate containing small amounts titanium oxide and ferric oxide. No. 2,013,856. Charles J. Kinzie, Niagara Falls, N. Y., to The Titanium Alloy Mfg. Co., N. Y. City.

Production zirconium silicon alkali metal composites. No. 2,013,857. Charles J. Kinzie, Niagara Falls, N. Y., to The Titanium Alloy Mfg. Co., N. Y. City.

Production ortho phosphoric acid by reacting tricalcium phosphate and sulfuric acid. No. 2,013,970. George F. Moore, Tampa, Fla., to U. S. Phosphoric Products Corp., N. Y. City.

Production potassium bicarbonate by reacting carbon dioxide with potassium chloride in ammonia and water mixture. No. 2,013,977. Hans Weiss, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Oxidation of nitrites to nitrates by reacting the nitrite with nitric acid and oxygen. No. 2,013,984. Walter Gross, Neuroessen, Germany, to I. G., Frankfort-am-Main, Germany.

Production acetyl chloride by reacting phosgene with liquid acetic acid. No. 2,013,988. Georg Meder, Munster-am-Taunus, Erich Eggert, Frankfort-am-Main-Sindlingen, and Albert Grimm, Knapsack, near Cologne-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Production acetyl chloride by reacting phosgene with gaseous acetic acid in presence of a phosphoric acid activated carbon. No. 2,013,989. Georg Meder, Munster-am-Taunus, Walter Geissler, Frankfort-am-Main-Hochst, and Erich Eggert, Frankfort-am-Main-Sindlingen, Germany, to I. G., Frankfort-am-Main, Germany.

Acetylene production by treating gaseous hydrocarbon in electric arc. No. 2,013,996. Paul Baumann, Ludwigshafen-am-Rhine, and Robert Stadler, Ziegelhausen, Germany, to I. G., Frankfort-am-Main, Germany.

Production salts of bromine substituted unsaturated fatty acids. No. 2,014,045. Siegwart Hermann, Prague, Czechoslovakia.

Production amyl substitution product of amylene diamine. No. 2,014,077. Melville M. Wilson, Chicago, Ill., to The Sharples Solvents Corp., Philadelphia, Pa.

Process recovering alcohols from hydrocarbons. No. 2,014,078. Francis M. Archibald and Philip Janssen, Elizabeth, N. J., to Standard Alcohol Co., a corp. of Del.

Production lead borate with electrolytic cell containing a boric acid electrolyte. No. 2,014,148. Guilio E. Sievert, South Gate, Cal.

Adhesive base containing proteinous substance of zinc chloride with organic compound. No. 2,014,167. Albert Henry Bowen to I. F. Laucks, Inc., both of Seattle, Wash.

Production acetone by reacting acetylene and steam in presence of catalytic mixture prepared from two metal oxides. No. 2,014,294. Koloman Roka and Karl Wiesler, Constance, Germany.

Production carboxylic acid esters of 2-butyloctanol. No. 2,014,310. Thomas F. Carruthers, South Charleston, W. Va., to Carbide & Carbon Chemicals Corp., a corp. of N. Y.

Production soluble cocoa by alkalizing and subjecting alkalized reactant to enzyme of diastatic action. No. 2,014,342. Gurney O. Gutekunst, Rochester, N. Y.; 20/100 to Charles E. Rogers and 30/100 to Russel H. Rogers, both of Detroit.

Production cyclic organic disulfides by oxidizing sodium salt of cyclic dithiocarbamate with ammonium persulfate. No. 2,014,353. Howard I. Cramer, Cuyahoga Falls, Ohio, to Wingfoot Corp., Wilmington, Del.

Metals, Alloys, Ores

Welding rod alloy 15% to 45% nickel, silicon up to .75%, manganese up to .75%, and remainder copper. No. 2,012,450. Ira T. Hook, New Haven, Conn., to The American Brass Co., Waterbury, Conn.

Production wrought iron articles using chromic oxide, titanium oxide, or vanadic oxide during manufacture. No. 2,012,599. Martin J. Conway, Coatesville, Pa.; one-half to Charles Hart, Media, Pa.

Production coated non-ferrous metal of lead, tin, cadmium or alloy class, coated with organic salt of metal being coated. No. 2,012,697. Robert R. Tanner, Highland Park, and Herman J. Lodeesen, Detroit, Mich., to Metal Finishing Research Corp., Detroit, Mich.

Production self-hardening alloy steel of carbon, chromium, nickel, molybdenum with tungsten, molybdenum, manganese, silicon, phosphorus, sulfur, balance iron. No. 2,012,765. Paul Pierre Marthourey, Asnieres, France, to Acieries de Gennevilliers, France.

Production carbon free alloys free also of silicon, oxygen, nitrogen, sulfur, phosphorus, etc. No. 2,012,777. Wilhelm Rohn to Heraeus-Vacuumschmelze A. G., both of Hanau-am-Main, Germany.

Production large crystalled bodies from tungsten using finely divided tungsten reducible by hydrogen and a compound of silicate, borate, phosphate, fluoride group. No. 2,012,825. Theodore Millner, Ujpest, and Paul Tury, Budapest, Hungary, to G. E. Co., a corp. of N. Y.

Production pyrotechnic composition comprising mixture of zirconium, and a perchlorate as oxidizing agent. No. 2,012,866. Joseph B. Decker and Herbert C. Clauser, Elkton, Md.

Production carbon free, age hardened metallic alloy of about 20% to 35% cobalt, 15 to 30% either tungsten or molybdenum, up to 3% vanadium, .8% manganese, remainder iron. No. 2,012,890. Charles Philip Miller, Romiley, England, to the Carboloy Co., Inc., a corp. of N. Y.

Production alloy consisting of copper, nickel and zinc by first forming copper-nickel alloy and introducing zinc to molten mass. No. 2,012,966. Harlan J. McFadgen, Sr., to Chrome Alloys Mfg. Co., a copartnership composed of Franklin Warner and Harlan J. McFadgen, Sr., all of Oakland, Cal.

Production alloy steel containing sulfur, vanadium, manganese, and carbon. No. 2,013,137. Walter Crafts, N. Y. City, to Electro Metallurgical Co., a corp. of W. Va.

High temperature chromium coating for vessels. No. 2,013,185. Ross C. Powell, Forest Hills, N. Y., to The Texas Co., N. Y. City.

Martensitic low carbon steel by heating pre-formed low carbon steel and quenching in aqueous alkali. No. 2,013,249. George F. Nelson, Berkeley, Cal.

Storage container for beer having inner surface of high copper content copper-silicon-tin alloy. No. 2,013,326. Richard A. Wilkins to Revere Copper & Brass Inc., both of Rome, N. Y.

Storage container for beer having 88% copper content lining of a copper-silicon-iron alloy. No. 2,013,327. Richard A. Wilkins to Revere Copper & Brass Inc., both of Rome, N. Y.

Production non-ferrous solder by melting and alloying zinc and aluminum beneath sodium cyanide protective coating. No. 2,013,340. James E. Dempsey, Detroit, Mich.

Method coating iron or steel with tin without preliminary finish. No. 2,013,364. Andrew C. Simmons to Keystone Steel & Wire Co., both of Peoria, Ill.

Production high silicon and high manganese steel containing also sulfur, phosphorus, and carbon. No. 2,013,443. Abner C. Jones to Lebanon Steel Foundry, both of Lebanon, Pa.

Lead alloy containing small amounts of strontium and tin. No. 2,013,487. Robert H. Canfield and Herman F. Kaiser, Washington, D. C.

Reduction of rusting tendency in iron by addition of tin to alloy. No. 2,013,600. Karl Carius, Dortmund, Germany, to firm Vereinigte Stahlwerke Akteingesellschaft, Dusseldorf, Germany.

Treating rare-earth metal compounds in aqueous solution. No. 2,013,767. Rudolf Schulze, Bitterfield, Germany, to I. G., Frankfort-am-Main, Germany.

Process for utilization of battery plate scrap forming antimonial leads of high and low antimony content. No. 2,013,813. Alfred M. Thomsen, San Francisco, Cal., to Thomsen Chemical Corp., a corp. of Cal.

Zinc base alloy containing aluminum, magnesium, titanium, balance zinc. No. 2,013,870. George H. Starmann to Apex Smelting Co., both of Chicago.
Production molybdenum-titanium-ferro alloys. No. 2,013,877. George F. Comstock, Niagara Falls, N. Y., to The Titanium Alloy Mfg. Co., N. Y. City.
Process improving aluminum alloys. No. 2,013,926. Aladar Pacz, Cleveland, Ohio.
Molybdenum white iron casting alloy containing carbon, silicon, manganese, chromium, molybdenum, and balance iron. No. 2,014,002. Carl M. Loeb, Jr., to Climax Molybdenum Co., both of N. Y. City.
Production alloy containing silver, copper, cadmium, and zinc. No. 2,014,083. John Johnson, Manville, N. J.
Steel adapted to hydrocarbon cracking of chromium, aluminum, silicon, molybdenum, beryllium, but no nickel. No. 2,014,189. Hermann Josef Schiffler to Vereinigte Stahlwerke Akteingesellschaft, both of Dusseldorf, Germany.
Production white cast iron alloy of cementite containing silicon, manganese, sulfur, phosphorus, and manganese with chromium or copper. No. 2,014,238. Frank A. Raven, Albany, and Clarence D. Foulke, Buffalo, N. Y., to Industrial Furnace Corp., Buffalo, N. Y.

Paper and Pulp

Production insulating fiber board. No. 2,012,805. Alfred G. Brown, Los Angeles, Cal., to Stephen E. McPartlin, Chicago.

Petroleum Chemicals

Production metallo organo derivatives using gasoline. No. 2,012,356. Sol Shappirio, Washington, D. C.
Production stabilized mineral oils using small amount oil soluble amide to prevent deterioration. No. 2,012,918. Bernard Harvey Shoemaker, Hammond, Ind., to Standard Oil Co., Chicago, Ill.
Production motor fuel of small part liquid paraffin hydrocarbons, smaller part methyl alcohol, and borneol or isoborneol blending agent. No. 2,012,945. Juilius F. T. Berliner and Richard W. Plummer to E. I. du Pont de Nemours & Co., all of Wilmington, Del.
Impregnating wood with preservation paste of water-soluble preservative. No. 2,012,975. Carl Schmittutz, Bad Kissingen, Germany, to Osmose Holzimpraegnierungs G. m. b. H., Leipzig, Germany.
Production wood preserving composition comprising viscous tack paste, water soluble protective agent, water, and glutinous substance. No. 2,012,976. Carl Schmittutz, Bad Kissingen, Germany, to Osmose Holzimpraegnierungs G. m. b. H., Leipzig, Germany.
Ester preparation producing oxygenated organic compounds by heating primary alcohols under superatmospheric pressure in presence dehydrogenation catalyst and water. No. 2,012,993. Per K. Frolich, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del
Solvent extraction of petroleum distillates. No. 2,013,040. David F. Edwards and John V. Starr, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.
Process producing colorless doctor sweet gasoline using alkaline sweetening agent. No. 2,013,083. Michael J. Welch, Brunswick, Ga., to The Gray Processes Corp., Newark, N. J.
Production motor fuels containing hydrocarbons, and colloidal solution of non-toxic metal of tin, aluminum, zinc group. No. 2,013,152. William D. Hoyt, Lexington, Va.
Use of organic oxides as gum inhibitors in hydrocarbon motor fuels. No. 2,013,198. Arthur L. Blount, Palos Verdes Estates, Cal., to Union Oil Co., of Cal., Los Angeles.
Production mercaptans from petroleum hydrocarbons by reacting hydrocarbon vapors with sodium plumbite solution and hydrolyzing lead mercaptides with steam. No. 2,013,203. William N. Davis and Melvin M. Holm, Berkeley, Cal., to Standard Oil Co. of Cal., San Francisco.
Process refining cracked hydrocarbon distillates by treatment with sulfuric acid containing ferric chloride. No. 2,013,399. Wayne L. Benedict and Charles Wirth, 3rd, to Universal Oil Products Co., all of Chicago.
Process refining cracked hydrocarbon distillates using hydrochloric acid and ferric sulfate. No. 2,013,400. Wayne L. Benedict and Charles Wirth, 3rd, to Universal Oil Products Co., all of Chicago.
Production purified asphalt from soap-containing asphaltic petroleum residuum. No. 2,013,619. Harry F. Angstadt, Media, Pa., to Sun Oil Co., Philadelphia, Pa.
Refining hydrocarbon oil for sulfur removal by addition of ether of polyhydric alcohol. No. 2,013,663. William M. Malisoff to The Atlantic Refining Co., both of Philadelphia, Pa.
Stabilization cracked hydrocarbon spirits normally forming gum by use of organic gum inhibitor. No. 2,014,200. Frederick Baxter Downing, Carneys Point, N. J., and Herbert Warren Walker, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Treatment hydrocarbon motor fuel to prevent gum formation by adding small quantity unrefined corn oil. No. 2,014,235. Charles D. Lowry, Jr., to Universal Oil Products Co., both of Chicago.

Pigments

Production pigment comprising dried froth of co-precipitated barium sulfate and ferric oxide mixture with pine tar type foaming agent. No. 2,012,823. Charles R. Park, Cuyahoga Falls, Ohio, to The Firestone Tire & Rubber Co., Akron, Ohio.
Production pigment by mixing acid mine waters and basic open hearth slag. No. 2,013,602. George L. Collord, Pittsburgh, Pa.
Zinc oxide production for pigment purposes by heating mixed and agglomaterated zinciferous and carbonaceous material to produce volatilized zinc. No. 2,013,980. Earl H. Bunce, Palmerton, Pa., to The N. J. Zinc Co., N. Y. City.

Resins, Plastics, etc.

Transparent, highly flexible composite sheeting of starch, sugars, gums, pentoses, and ethers and esters thereof. No. 2,012,344. Harold Alvin Levey, New Orleans, La.
Production olefine-polysulfide plastic by reacting olefine dihalide with water soluble polysulfide in presence of insoluble basic dispersion compound. No. 2,012,347. Joseph C. Patrick, Kansas City, Mo.
Formation urea-formaldehyde condensation products by condensing urea and formaldehyde in presence activated silica gel and adding acetate. No. 2,012,411. Ludwig W. Wasum, Hackensack, N. J., to Crystalite Corp. of America, N. Y. City.
Production heterocyclic-esters of resin acids. No. 2,012,622. Joseph N. Borglin to Hercules Powder Co., both of Wilmington, Del.
Production synthetic resinous products by reacting primary aromatic amine with formaldehyde in presence acid. No. 2,013,589. Theodor Sutter, Basel, and Werner Wieland, Riehen, near Basel, Switzerland, to firm Society of Chemical Industry in Basle, Basel, Switzerland.
Production fibrous bodied articles covered with thermoplastic vinyl resin layer. No. 2,013,865. Edward C. Sloan to Jesse B. Hawley, both of Geneva, Ill.
Preserving and protecting bodies covered with thermoplastic vinyl resin layers. No. 2,013,867. Edward C. Sloan to Jesse B. Hawley, both of Geneva, Ill.
Production heat and exposure resistant vinyl resins. No. 2,013,941. Charles O. Young and Stuart D. Douglas, Charleston, W. Va., to Carbide & Carbon Chemicals Corp., a corp. of N. Y.
Production insulating building and sound absorbing material of rock sponge mixed with plastic material. No. 2,014,064. Frederick William Claybrook, Cumberland, Md.

Rubber

Production rubber composition using aqueous dispersion of rubber material and water soluble reagent. No. 2,012,727. Edward Arthur Murphy, Erdington, and Douglas Frank Twiss, Wylde Green, England, to Dunlop Rubber Co., Ltd., a corp. of Great Britain.
Production vulcanized rubber using mercaptobenzothiazole and an acidic salt of an amido derivative of carbamic acid with rubber during vulcanization. No. 2,013,117. William F. Tutley, Nutley, N. J., to U. S. Rubber Co., N. Y. City.
Preserving rubber composition by incorporating a homogeneous plastic solution of diarylamine in neutral wax in rubber before vulcanization. No. 2,013,319. Waldo L. Semon, Cuyahoga Falls, Ohio, to The B. F. Goodrich Co., N. Y. City.
Food canning process by luting container seal with rubber cement in petroleum naphtha containing a hydroxy aryl compound. No. 2,013,343. Ernest E. Follin to Standard Oil Co., both of Chicago.
Production rubber composition containing carbon black, and aliphatic alcohol. No. 2,014,198. Elmer K. Bolton and Oliver M. Hayden to E. I. du Pont de Nemours & Co., all of Wilmington, Del.
Production rubber article by mixing thickened aqueous dispersion with ammonium salt. No. 2,014,253. Walter Kay, Bury, England, to Kaysam Corp. of America, Dover, Del.

Textile, Rayon

Process soaking raw silk using oil-in-water emulsion containing water soluble sulfate salt of normal straight chain primary alcohol. No. 2,012,610. Samuel Lenher to E. I. du Pont de Nemours & Co , Wilmington, Del.
Rayon production. No. 2,012,723. George R. Lockhart, Providence, R. I., to Manville Jenckes Corp., a corp. of Del.
Method testing water imperviousness of impregnated textiles. No. 2,012,762. Rudolf Kern, Oschatz, Germany, to firm Chemische Fabrik R. Baumheier Akteingesellschaft, Zschollau, near Oschatz, Germany.
Process treating yarns using bath of aluminum sulfate and a reducing salt derived from sulfur. No. 2,012,769. Louis Peufaillit, Paris, France.
Inhibiting fungi or mould growth on textile materials using precipitated barium borate. No. 2,013,081. Charles Richard Noel Strouts, Ardrossan, Scotland, to Imperial Chemical Industries Ltd., a corp. of Great Britain.
Method for extruding viscose. No. 2,013,491. Erwin O. Freund to The Visking Corp., both of Chicago.
Production mixed shades on textile materials. No. 2,013,689. Ernest William Kirk and George Holland Ellis, Spondon, near Derby, England, to Celanese Corp. of America, a corp. of Del.
Fabric cleaning and dyeing composition containing vegetable oil soap, soluble sulfonated oil or fat, soluble albuminoid, soluble alkali sulfate, ammonium chloride, alkali perborate, and coal tar dye. No. 2,014,007. Eugene C. Pailler to Silkeze Corp., both of Boston, Mass.
Production artificial filaments with spinning solution of viscose, cuprammonium cellulose, burnt tin oxide, and highly volatile organic liquid. No. 2,014,343. Theodore Koch and Johannes Gerardus Weeldenburg, Arnhem, Netherlands, to American Enka Corp., Wilmington, Del.

Water, Sewage Treatment

Chlorinating device for water. No. 2,012,406. Walter Lee Savell, Forest Hills, N. Y., to The Mathieson Alkali Works, Inc., N. Y. City.
Process for sewage chlorination. No. 2,013,577. Howard J. Pardee, N. Y. City.

Miscellaneous Booklets

Ceramic Forum, August. More news of and for the ceramic industry with special attention going to "Effect of Furnace Gases on Ground Coat Enamels," by W. C. Cummings. Pictures of interesting new products are appealing.
Graduate School of Business Administration, George F. Baker, Foundation, Harvard University. "The Use of Statistical Techniques in Certain Problems of Market Research," by Theodore Henry Brown. No. 12 of the Business Research Studies. $1.00.
Industrial Research Dept., Wharton School of Finance & Commerce, University of Pennsylvania. "Is Industry Decentralizing?" Bulletin No. 3 in the Study of Population Redistribution, by Daniel B. Creamer.
Institute of Metals (British). "The Protection of Magnesium Alloys Against Corrosion," by H. Sutton and L. F. Le Brocq, a special printing in booklet form (Paper No. 709) of paper presented before autumn meeting of the Institute. Article will appear in full in the *Journal of the Institute of Metals.*
International Tin Research & Development Council, Manfield House, 378 Strand, London. W. C. 2. "Examination of the Surface of Tinplate by an Optical Method," by W. E. Hoare and Bruce Chalmers. Series A., No. 21.
Kansas City Testing Laboratory, 700 Baltimore ave., Kansas City, Mo. "Patents and Manufacturing Formulae," Bulletin No. 26. Information of particular interest at this time.
Storrs Agricultural Experiment Station, Connecticut State College, Storrs, Conn. "Fertilizers for Potatoes," 2nd report covering response to nitrogen, phosphoric acid and potash, and effects of magnesia and lime. By B. A. Brown. Bulletin 203.
U. S. Dept. of Commerce, Bureau of the Census, Washington, D. C. "Animal and Vegetable Fats and Oils." Quarterly reports for calendar years 1930-'34 on production, consumption, imports, exports and stocks. 5c.
Dept. of Commerce, Bureau of Foreign and Domestic Commerce, Division of Commercial Laws. "Statutes of Limitations and the Principal Commercial Legal Remedies as Related to Latin America," by H. P. Crawford, Latin American Legal Section. 5c.

Chemical Markets & News

Douglas Calls Administration "Irresponsible" in Address Before the American Mining Conference—Natural and Synthetic Nitrogen Producers Conclude 3-Year Pact—Wood Naval Stores Producers Form Export Association—President Rules on Trade Concessions—P. & G. and Colgate Fail in Suit Against Lever Bros.—Synthetic Tariff Rate Unchanged—

Lewis W. Douglas, Cyanamid vice-president and former director of the U. S. Budget, was a speaker before the American Mining Congress at the Palmer House in Chicago last month, his subject:—"Government Spending of the Taxpayers' Money."

A "Spendthrift" Government

The assertion that an "irresponsible, spending government at Washington" is driving the country toward destruction of its currency, widespread suffering, "crucifixion" of the "middle class," dictatorship and some form of fascist or collectivist State was made by the former director of the Budget.

"The various acts of the New Deal make a complete picture of socialism, each part fitting into a perfect design," he said. "The monetary and fiscal policy parallels what was done in Russia after the fall of the Kerensky régime

"This is a spending policy. I am amazed at the extent to which the human mind loses its sense of proportion. In 1931 we experienced a deficit of $900,000,000 and considerable apprehension was shown in Congress. We are now told blithely that in 1936 the deficit will exceed $4,500,000,000.

"In 5 years there has been an accumulated deficit of $14,000,000,000 and in 6 years it is estimated it will approach $20,000,000,000. The deficit is rising despite the semblance of recovery. We have had something of a recovery, yet relief and public work expenditures keep increasing.

"No other conclusion is possible than that the administration at Washington is an irresponsible, spending government, its spending conducted by those who have no knowledge of how wealth is produced, and perhaps care less. No living man knows the contingent liabilities of the Federal Government.

"There is a real fear as to the security of our government and our people. Whenever a government has continued to spend more than it has taken in, it has destroyed in whole or in part its currency. This brings pain and poverty and the great middle class is crucified.

"Our present spending device is to compel the commercial banks to take government obligations. This is credit inflation. A 15% depreciation in government obligations would make almost 80% of these banks bankrupt."

3-Year Nitrogen Agreement

Just at the moment when many were preparing to believe that the officially secretive meetings of the representatives of Chile and the international nitrogen cartel were likely to end in positive disagreement the discreet publicity department of British I. C. I. "broke" the story on Sept. 9 of the signing of the formal pact which runs for 3 instead of the usual one-year period and is dated as of July 1. Document is said to be substantially one initialed in July at Scheveningen (one of the several cities and watering spots visited by the delegates), except that provision was made for the likely reduction in outside French purchases.

Chile Wins with a "Trump Card"

Improved conditions in Chile provided these representatives with a "trump card" and after considerable bluffing by both sides natural producers obtained most of the concessions sought.

Agreement for '34-'35 allowed Chile a quota of 50,000 metric tons of actual nitrogen for the protected markets plus a percentage quota for the open markets corresponding to the percentage of the Chilean imports supplied in '33-'34.

Countries signing were Belgium, Czechoslovakia, Germany, Great Britain, Holland, Italy, Norway, Poland and Switzerland. Japan is reported as not signing and considerable speculation as to the possible causes and effects of such action are heard. U. S. market is not included in the pact. Agreement may be broken under certain circumstances after 2 years.

Decline in outside purchasing by France expected in the coming year (result of a feverish domestic construction program) undoubtedly will have an effect in the U. S., for the synthetic producer has obtained at least a share of this tonnage for several years. French Government is insisting on an additional 6% (in addition to an earlier 4%) reduction in nitrogen fertilizer prices to French agriculture.

Operating under the provisions of the old nitrogen fertilizer cartel which expired on June 30 this year, Chile with its natural deposits was able to substantially increase its nitrate exports while Germany which produces nitrogen synthetically has been losing ground in the export field. These trends explain the severe difficulties encountered in recent negotiations at London to establish a new cartel, the Chileans not wishing to relinquish their gains and the Germans wishing to improve their position.

Chilean Exports

Chile exported a total of 1,281,000 metric tons of nitrate during the year ended June 30, '35, compared with 1,162,000 tons during the preceding fiscal year and only 270,000 tons in '32-'33, according to reports from Santiago. Approximately 30% of the '34-'35 total was shipped to the U. S. and 65% to Europe. Twenty plants were in operation during '34-'35. Sixteen of these operated throughout the entire year, 3 operated but one month each and one for 10 months.

Germany's Nitrogen Exports

Contrasted with Chile's record, German exports of nitrogenous fertilizer materials declined 16½% in volume to 540-584 metric tons in '34-'35 compared with the preceding year and the value received was down 22% to 43,045,000 marks.

Considerable shifts occurred during the year in the composition of Germany's nitrogenous fertilizer exports, most outstanding of which was a marked drop in foreign sales of ammonium sulfate.

Under the Webb-Pomerene Act

Wood Naval Stores Export Association files papers under the Export Trade Act (Webb-Pomerene law) with the F. T. C. for exporting FF wood rosin and pine oil. Association will maintain offices at 1220 Delaware Trust Bldg., Wilmington, Del.

Officers of the association are: N. P. Hatten, chairman; A. B. Nixon, secretary; L. H. Dreyfus, and H. A. Mackie, directors. Members are: Phoenix Naval Stores Co., Inc., Gulfport, Miss.; Dixie Pine Products Co., Hattiesburg, Miss.; Hercules Powder Co., Wilmington, Del., and Mackie Pine Products Co., Covington, La.

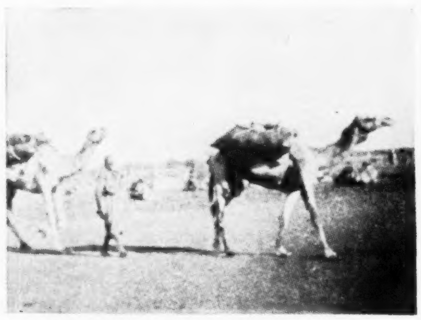
The Story of Gum Arabic

1. Tear of Gum Arabic.

2. Wild Gum Trees (Acacia Verek).

3. Tapping the Tree; the bark is loosened and stripped off.

4. Collecting the Gum.

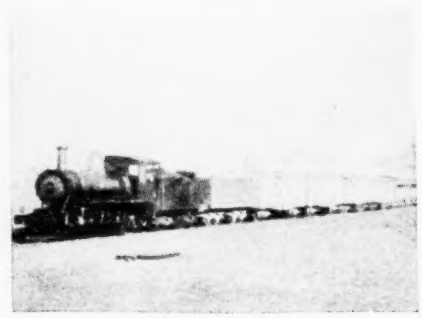


5. Loaded Camels entering market at El Obeid.

6. Scene in Gum Market, El Obeid.

7. Resacking purchased gum from Arabs' Sacks (Skin).

8. Cleaning Gum for Shipping.



9. On Sudan Government Railways, en route for Port Sudan.

10. Steamer at Port Sudan en route for world's markets.

Arabic, Karaya and Tragacanth Gums—supplied from our large stocks in all grades, in any form, type or quality, and for every purpose.

● We have been importing and milling gums for over 20 years and can supply you with gums from stock, undiluted, unblended in the original import packages, or milled to your own specifications.

Write us today of your special requirements or send us samples of gums you now use and we will match with counter samples and submit quotations.

PHOTOGRAPHS COURTESY OF OXFORD UNIVERSITY PRESS AND WELLCOME TROPICAL LABORATORIES.

JACQUES WOLF & CO.

MANUFACTURING CHEMISTS AND IMPORTERS . . . PASSAIC, NEW JERSEY

Warehouses: **Providence, R. I., Philadelphia, Pa., Utica, N.Y., Chicago, Ill., Greenville, S. C., Chattanooga, Tenn.**

Export Trade Act grants exemption from the anti-trust laws to an association entered into and solely engaged in export trade, with the provision that there be no restraint of trade within the U. S., or restraint of the export trade of any domestic competitor, and with the further prohibition of any agreement, understanding, conspiracy or act which shall enhance or depress prices or substantially lessen competition within the U. S., or otherwise restrain trade therein.

Spain Almost Makes It Unanimous

Trade pact between Spanish potash producers and producers in Germany, France, and Poland for regulating world potash trade, which was reported to have been signed some time ago, has now been confirmed. While details of the agreement are not available it is known that the 2 remaining independent Spanish producers signed the cartel agreement which, together with a third company that has belonged to the cartel for some years, brings the entire Spanish potash industry into alliance with the European Cartel. Cartel as it now stands includes all important European producers except Russia and Palestine.

Customs and Tariffs

¶President Ends Tariff Concessions to Germany Following Provocative Acts — President Rules on Other Countries—No Change in 5c Tariff on Synthetic Camphor—

Present U. S. action on trade with Germany was definitely forecast 5 months ago when Secretary Hull pointed out that while the Tariff Act of '34 requires our government to generalize for the benefit of all nations any concessions made in reciprocity agreements, it also authorizes the President to make an exception to this rule in the case of any country guilty of "discriminatory treatment of American commerce." Secretary Hull did not fail to point out that import quotas and allocation of exchange (a few of the measures adopted by the Reich) were considered "discriminatory."

The German Government within the past few months has also annulled the most-favored nation clause in a long-standing trade agreement, and this action has aggravated the feeling in the matter.

Importers of German chemicals are apprehensive of the repercussions following the action of this government in notifying the German Embassy on Sept. 12 that on Oct. 15 Germany will be deprived of concessions made to others in the reciprocal pacts. Even if the Reich approves before Oct. 14 the new commercial trade treaty negotiated by Secretary Hull and Dr. Hans Luther, and approved by the Senate, German goods will be at a distinct disadvantage when the U. S. starts to collect at the full tariff rate.

Hull Sees Discrimination

As long as Germany applied quotas equally to the goods of all countries, in an effort to restrict imports in the interest of conserving gold reserves, this government made no active representations. Gradually, however, agreements were made with various nations giving them preferential treatment on "frozen exchange" in return for tariff concessions, as Germany strove desperately to recapture her vanished export business.

This constituted discrimination, the State Department held, and a series of protests, formal and informal, were forwarded to Berlin.

Reichsfuehrer Adolf Hitler and Dr. Hjalmar Schacht, Minister of Economics and president of the Reichsbank, inaugurated in September, '34, a system of 25 import control boards that were intended so to regulate imports that Germany's balance with any given country would exactly offset that nation's balance in Germany. This plan is exactly opposed to Mr. Hull's theories of triangular trade balance settlements.

Effect on Chemical Trade

Effect generally of the commercial disagreement has been a sharp decline in shipments of goods from this country to Germany. Yet in the 1st quarter of '35 our exports, classified as chemical, increased, while our imports of products designated under chemicals and allied products, declined.

Formal Presidential Declaration

On Sept. 18 the President extended until Jan. 1 concessions to Canada, France, Holland, Spain and Switzerland. With all these countries negotiating trade agreements with us the action of the President was not unexpected. Without the proclamation such concessions would have ended on Oct. 1. It is hoped that the discriminatory trade practices complained of will be eliminated by mutual agreement.

Formal notice was given by the President to the Treasury on Sept. 18 that low tariffs conceded on articles affected by trade agreements should not be accorded to German goods after Oct. 15. Italy, Denmark and Portugal had been

COMING EVENTS

39th Annual Convention, American Photo-engravers Association, Hotel Statler, Detroit, Mich., Oct. 10-12.

Electrochemical Society, semi-annual meeting, Washington, D. C., Hotel Willard, Oct. 10-12.

Pennsylvania Water Works Association, 40th Annual Meeting, Haddon Hall, Atlantic City, week of Oct. 14.

24th National Safety Council, Louisville, Oct. 14-18.

American Gas Association, Palmer House, Chicago, Oct. 14-17.

American Society Municipal Engineers and International Association Public Works Officials, Netherland Plaza Hotel, Cincinnati, Ohio, Oct. 14-15.

South Section, American Water Works Association, Houston, Texas, Oct. 14-17.

Fourth Annual Drug Trades Exposition, Grand Central Palace, N. Y. City, Oct. 15-17.

Penna. Water Works Association, Annual Convention, Hotel Haddon Hall, Atlantic City, N. J., Oct. 16-18.

New York Section, American Water Works Asociation, Hotel Powers, Rochester, N. Y., Oct. 17-18.

Minnesota Section, American Water Works Association, St. Paul, Minn., Oct. 18-19.

Laundryowners' National Association, Hotel Traymore, Atlantic City, Oct. 21-24.

Third Annual Industrial Materials Exhibit, Hotel Astor, N. Y. City, Oct. 21-25.

Oil Trades Association of N. Y., Annual Banquet, Oct. 22, Albert J. Squier, chairman.

California Section, American Water Works Association, San Diego, Cal., Oct. 23-26.

Tanner's Council of America, fall meeting, Palmer House, Chicago, Ill., Oct. 24-25.

Central States Sewage Works Association, Annual Meeting, Urbana-Champaign, Ill., Oct. 25-26.

Annual Robineau Memorial Ceramic Exhibition, Art Division, American Ceramic Society, Syracuse, N. Y., Oct. 25-26.

Federation of Paint and Varnish Production Clubs, Washington, D. C., Oct. 27-29.

Second Annual Convention, National Paint, Varnish and Lacquer Association, Mayflower Hotel, Washington, Oct. 30-Nov. 1.

In connection with the convention the "Paint Show" will be held Oct. 27-29 at Washington.

13th Midwest Regional A. C. S. Meeting, Brown Hotel, Louisville, Oct. 31-Nov. 2.

Ohio Ceramic Industries Association, Annual Meeting, Columbus Ohio, Nov. 1-2.

North Carolina Section, American Water Works Association, Durham, N. C., Nov. 4-6.

Missouri Valley Section, American Water Works Association, Fort Des Moines, Ia., Nov. 6-8.

Virginia Section, American Water Works Association, Hotel Roanoke, Roanoke, Va., Nov. 7-8.

Association of Official Agricultural Chemist, Hotel Raleigh, Washington, D. C., Nov. 11-13.

American Petroleum Institute, Biltmore Hotel, Los Angeles, Nov. 11-14.

International Acetylene Association, 36th Annual Convention, Hotel Cleveland, Cleveland, Ohio, Nov. 12-15.

11th Annual Southern Convention, National Fertilizer Association, Atlanta, Ga., Nov. 12-15.

American Institute of Chemical Engineers, Columbus, Ohio, Deshler-Wallack Hotel, Nov. 13-15.

Working Association for Combating & Preventing Corrosion, Berlin, Nov. 18-19.

Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 2-7.

Ceramic Society of New Jersey, Annual Meeting, New Brunswick, N. J., Dec. (exact date announced later).

American Society of Agronomy, Annual Meeting, Chicago, Dec. 5-6.

American Association of Textile Chemists and Colorists, Annual Meeting, Chattanooga, Tenn., Dec. 6-7.

National Association of Insecticide & Disinfectant Manufacturers, N. Y. City, Dec. 10.

Sixth National Organic Chemistry Symposium, Rochester, N. Y., Dec. 30.

National Shoe Retailers Association, and National Boot and Shoe Manufacturer's Association, Joint Convention and Style Show, Chicago, Ill., Jan. 6-9, 1936.

Fourth International Heating and Ventilating Exposition, International Amphitheatre, Chicago, Jan. 29-31, 1936.

Sixth Packaging Exposition, Hotel Pennsylvania, N. Y. City, Mar. 3-6, 1936.

American Ceramic Society, 1936 Annual Meeting, Columbus, Ohio, Mar. 29-Apr. 4.

American Chemical Society, 91st Meeting, Kansas City, Mo., Apr. 13-17, '36.

American Water Works Association, Annual Convention, Biltmore Hotel, Los Angeles, Cal., June 8-12, 1936.

Chemical Engineering Congress, Central Hall, Westminster, England, June 23-27, 1936.

LOCAL*

Oct. 11. N. Y. Section, A. C. S.

Oct. 25. New York Section, American Institute of Chemists.

Nov. 8. N. Y. Section, A. C. S., Chemical Industry Medal.

Dec. 12. N. Y. Paint, Varnish & Lacquer Association.

* Meetings held at Chemists Club unless otherwise noted.

placed on a list to enjoy the privileges for an indefinite period, terminable on 30 days' notice from the President.

Italy is now negotiating a trade agreement. Portugal and Denmark have as yet taken no steps to stop the discrimination to which the State Dept. objects.

Synthetic Camphor Rate

Tariff Commission reports that the President has approved its report on synthetic camphor. In this report, the last of 3 under paragraph 51 of the Tariff Act of '30, the Commission found that no change is required in the rate of duty. Paragraph 51 imposes a duty of 5c per lb. on synthetic camphor but provided that the rate should be reduced to 1c per lb. if the domestic production did not exceed: (a) 25% on the domestic consumption during the 6 months ended June 17, '33; (b) 30% on the domestic consumption during the 6 months ended June 17, '34; (c) 50% on the domestic consumption during the 6 months ended June 17, '35.

In each of the 1st 2 of its investigations, Commission found that the ratios of domestic production to consumption of synthetic camphor during the 1st 2 periods were substantially in excess of the requirements for those periods; namely, 25% and 30%, respectively. Present report, covering the 3rd and last period, shows that the domestic production of synthetic camphor greatly exceeded the 50% specified in the law.

Consumption of 1,169,414 lbs. of synthetic camphor during the 3rd and final period of the investigation (Dec. 18, '34, to June 17, '35), compares with the consumption of 886,428 lbs. during the 2nd period (Dec. 18, '33, to June 17, '34), and 397,138 lbs. during the 1st period (Dec. 18, '32, to June 17, '33).

Entire domestic output was by one manufacturer until late in '34 when another domestic firm began production of synthetic camphor at a plant in New Jersey.

Now Enter U. K. Free

Great Britain is now permitting crude iodine, a number of intermediates, and several terpeneless essential oils to enter free.

Chemical Foundation Booklets

"A Second Primer—The results of a year of simple arithmetic," by Samuel Crowther, is latest Chemical Foundation publication. Booklet deals with modern problems in foreign trade.

Story of Stainless Steel

Another booklet of the Foundation just released that will provide a wealth of information is "The Stainless Prince of Steels." It is a story of the part played by stainless steel in the advancement of science and industry and the protection of the public health.

Litigation

¶Lever Bros. Emerges Victor in Granulated Soap Patent Struggle —Broad Patent Claims Attacked in Decision—

A $40,000,000 soap "bubble" burst in South Bend, Sept. 14, when Federal Judge Thomas W. Slick ruled that Lever Bros.' Rinso was not manufactured in such a way as to infringe on process patents jointly held by the 2 other "giants" of the U. S. soap industry, P. & G., and Colgate-Palmolive-Peet.

Three entries on the struggle for the granulated soap market. Left to right, Lever Bros. "Rinso," Colgate's "Super-Suds," and P. & G.'s "Chipso."

"Soapers" have closely followed the 4-year struggle of the 3 titans for control of the granulated household soap business, most lucrative division of the industry. Colgate's "Super-Suds," P. & G.'s "Chipso," and Lever Bros.' "Rinso" vie for the house-wife's favor, and the competition has been terrific. Victory for the plaintiffs would permit the division between them of over 100,000,000 lbs. of granulated soap business valued at close to $15,000,000 sales annually. With such a prize at stake, the legal array was the best money could procure. At one time Newton D. Baker headed the combined forces of Colgate-Palmolive-Peet and P. & G., while the British Lever interests sent out one of England's most famous barristers, Horatio Ballantyne (See C. I., Jan., '35, p64). Aside from the specific interest decision holds for "soapers," ruling is noteworthy in that it continues recent trend against permitting wide interpretations on broad patents. In several important decisions rendered in the past few months federal judges have struck at patents which have claimed particularly broad coverage without sufficient substantiating evidence.

Judge Slick announced his verdict in 2 documents, a 7-page finding of facts in the case and an opinion filling 6 pages, with conclusions drawn from briefs submitted by both sides after 7 weeks of trial. Plaintiffs had sought an accounting of profits of Lever Bros. since 1927. It was estimated that the profits would have amounted to $40,000,000.

Judge Slick discussed the Lamont patent, involved in the action, as follows:

"In 1927 the Lamont patent was issued. It is quite apparent that Lamont in his application and specifications attempted to cover every possible description of a successful spray-dried soap product.

"While an inventor is entitled to the full benefit of his invention and the patent issued thereon, care must be taken to protect the public against extravagant claims and claims of invention covering matters already known and practiced in the art. This case furnishes a good example of difficulties frequently encountered in differentiating between old processes and a new process embracing and overlapping many known properties."

Judge Slick pointed to the differences in temperatures of soap at the spraying nozzle and also the differences in temperature of the air currents through which the sprayed soap falls, declaring that the Lamont patent details the best specifications for these parts of the process.

"The question then arises," he continued, "how nearly may these variables be approximated without infringing? The rational answer would seem to be that they may be approximated with a reasonable degree."

Judge Slick said the defendant should be commended for improving its product and that inasmuch as it made several improvements from 1910, when it started manufacturing spray-dried soap, up until 1927, when the Lamont patent was issued, it should not be required to stop improving its product because of the issuance of the patent.

He concluded:

"While defendant's product resembles, to the casual observer, the product of plaintiffs, it in many respects is quite dissimilar. I therefore conclude that neither defendant's process nor its process infringes on the patent of plaintiffs."

Foreign

¶Germany Announces Plans for a Naval Stores Industry—New Chrome Ore Deposit Reported in the Philippines—Foreign Notes

Germany, in keeping with its national policy of reducing imports by producing everything possible at home is planning a naval stores industry. Forest area being worked this year is estimated at 87,500 acres, or double that of '34, and output is expected to reach 393,600 gals. of turpentine and 3,500 metric tons of rosin.

Specialists who have given the matter careful study claim country is capable of producing 1,700,000 gals. of turpentine per annum or an amount equal to approximately one-fourth of Germany's normal requirements.

Russia, already an important producer and exporter of potash fertilizer, is now opening a new mine, which when completed is expected to bring the annual production of pure potash to at least 300,000 metric tons, making that country the 3rd largest world producer of this important fertilizer material.

China is to have a new Japanese chemical plant at Tsingtao which will produce 4,000,000 lbs. of sulfur black and 200,000 lbs. of methyl violet dyes per annum, according to reports from Tokyo. Intermediates and other raw materials will be supplied to the new plant from Japan and the output will be marketed in China through one of the large Japanese trading companies operating there.

China wood oil, or tung oil shipments from Hankow, the world's chief source of supply for this important paint and varnish ingredient, advanced considerably in quantity during the 1st 7 months of '35, compared with the corresponding period of last year, despite reports of bandit activities in the growing regions, severe floods at Hankow, and rapidly increasing prices.

Chrome Ore Source?

Judge John W. Haussermann, president of the Benguet Consolidated Mining (Manila, P. I.) announces a new large capital investment for the purpose of immediately bringing into production a chromite mine in the Province of Zambales that is reported to be the largest chromite ore body thus far discovered.

British Chemical Happenings

British chemical production declined slightly in the 2nd quarter according to the Board of Trade Index.

Two valuable booklets appeared in London chemical circles last month. London Shellac Research Bureau is publishing abstracts on shellac research literature: The Copper Development Association is issuing a series on copper for use by engineers.

Solvents plant of Commercial Solvents, Ltd., at Bromborough, near Birkenhead, is rapidly approaching completion. Operating company is British and is owned jointly by Commercial Solvents and Barter Trading.

British Chilean nitrate prices have been announced. From Aug. 1, '35, to June 30, '36, to farmers for sodium nitrate, granulated, 16% N, and crystals, 15.5% N, £7/12s 6d. a long ton; and for sodium-potassium nitrate, 14 to 15% N and 14 to 15% K20, £8 15s.; gross weights, for lots of not less than 6 tons, delivered free to any railway station.

German Developments

The German Bureau of Standards has released standard specifications for lithopone, dry and ground in oil. These specifications are identified by the series number RAL 844J.

I. G. and Japs Fail in Dye Pact

Reports from abroad indicate that the I. G. F. for some months has been attempting to make an agreement with Japanese dye producers regarding the division of Oriental markets, but so far has been unsuccessful.

Ink Solvent Recovery

It is reported that a solvent recovery plant is now in operation in one of the largest German printing establishments.

Miscellaneous Notes

An Italian chemical company with offices at Genoa receives authorization to increase production of its nitrogen and ammonium nitrate plants and to establish a new factory for the production of nitric acid.

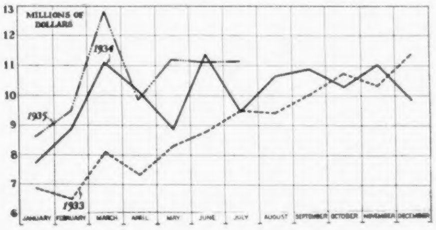
Reports from abroad seem to indicate that the Comptoir des Phosphates d'Algerie et de Tunisie (formed by North African producers) is functioning smoothly.

Russian '34 potash fertilizer production totalled 95,000 metric tons of pure potash compared with only 31,000 in the preceding year.

Foreign Trade

¶Our July Exports and Imports Top Figures of a Year Ago—Germany Subsidizes Manufacturers in Export Trade—Markets in Union of South Africa—

July exports of chemicals and allied products continued upward trend with most major groups showing considerable increases both in quantity and value over last year. Value total amounted to $11,-152,000, compared with $9,474,000 for July '34, or an increase of almost 18%.



U. S. exports of chemicals and allied products show large increases over '34.

Industrial chemicals, which include such commodities as acids, alcohols, sulfates, chlorides, sodium compounds, and collodions, led in importance among the different classifications, reaching total value of $2,151,000, compared with $1,-865,985, for July, '34. Export shipments of sodium compounds amounted to 24,100 tons valued at $826,225, against 20,500 tons valued at $778,890 in July last year. Value of chemical specialty exports, which include insecticides, fumigants, cementing preparations, polishes, etc., totaled $965,325 in July, an increase of $63,-100 over July, '34. Fertilizer exports took a sharp upturn with practically all classes sharing in the gain, particularly nitrogenous materials and phosphates. Value of shipments totaled $1,173,350, compared with $579,200 in the preceding month, and $654,130 for July last year.

Exports of coal tar products were also well maintained in July reaching the value of $1,044,000, an increase of $154,-700 over July, '34. In this classification, shipments of coal-tar colors, dyes, stains and color lakes amounted to 1,921,780 lbs. valued at $647,480, compared with 1,516,-550 valued at $431,570 during July of last year. Sulfur exports continued weak amounting to only 33,188 tons valued at $639,200, against shipments of 53,834 tons valued at $972,800 in July, '34.

They Like Our Paints

Foreign demand for American paint products continued active in July but showed signs of spottiness, particularly in pigments. World demand for American ready mixed paints, however, was well maintained with export shipments of all classes well ahead of July, '34. Pigments, paints and varnishes exported in July were valued at $1,301,700, an increase of $19,830 over July last year. Chemical pigments accounted for $638,750, a decline of $62,630 compared with July, '34, and the quantity decreased from 13,247,-000 lbs. to 11,841,000, loss being due to smaller foreign shipments of carbon black. There was also a decline in export shipments of mineral earth pigments.

Exports of ready mixed paints during the month totalled 175,000 gals. valued at $313,550 compared with 171,000 ($307,-500) in July last year. Exports of lacquers increased in value from $111,400 to $163,750; varnishes from $39,200 and $41,450; and miscellaneous products including cold-water, bituminous, and paste paints, from $83,000 to $120,000.

We Import More, Too

Notwithstanding smaller imports of fertilizers, industrial chemicals and many other important items in July, total value of chemicals and allied products imported during the month was considerably higher than for July, '34, due mainly to rising prices and heavier receipts of paint materials including tung, perilla, and soybean oils. Value of all chemical imports totalled $8,687,500 in July compared with $7,876,800 for the same month last year, preliminary statistics show.

Subsidies Successful

Effects of Germany's new export scheme of granting liberal subsidies to manufacturers engaged in export trade became apparent during the 1st month of its operation. Plan which was put into operation July 1 provides for subsidies to exporters in sufficient amounts to enable them to lower export quotations to levels competitive with foreign coun-

tries and is obtained from a tax ranging from 1 to 7% on all goods produced for domestic consumption.

Chemicals and allied products participated prominently in the July export expansion, increasing approximately 3,500,000 marks to a total of 50,000,000 marks compared with June, during which month Germany's chemical exports touched the lowest level in years. Exports of all commodities totalled 359,000,000 marks in July, an increase of 41,000,000 over the preceding month and 37,700,000 more than during July last year, official statistics show.

New system of export-promotion constitutes a serious drain upon German industrial concerns in lowering profits from their domestic business but greatly increases their ability to compete in foreign markets. The bounty enables them to meet virtually any competition if the transaction under negotiation is considered advantageous from an economic and financial standpoint by the Government.

American Chemicals in So. Africa

Imports of chemicals and allied products into the Union of South Africa have increased steadily in recent years due primarily to prosperous conditions resulting from the greatly increased value of gold in terms of depreciated currency, to recent improvement in agriculture, and to higher purchasing power of the South African pound, according to C. C. Concannon, Chief of the Commerce Dept.'s Chemical Division. Resumption of diamond washing at Kimberly during the early part of the current year, following a long period of inactivity, is expected to further improve the Union's import position.

Union purchased $2,115,000 worth from the U. S. during '34, or 12% of the total from all sources, including England. This compares with $1,444,000 recorded in '33, during which year the U. S. supplied 10%, and less than $1,000,000 in '32. In each of these years the U. S. was the largest foreign supplier.

Associations

¶National Safety Council Attracts Chemical Plant Executives—Salesmen Hold Big Golf Party—Rubber Groups Schedule Meetings

A concentrated drive against a common enemy — accidents — will be made when some 7,000 delegates representing all walks of life, all parts of the U. S. and several foreign countries assemble at Louisville to attend the sessions of the 24th Annual Safety Congress and Exposition from Oct. 14 to 18.

An interesting program has been prepared for the Chemical Section, the officers of which are: General chairman, A. L. Armstrong, Eastman Kodak Co., Rochester, N. Y.; vice-chairman in charge of program, H. L. Miner, du Pont; vice-chairman in charge of engineering, C. L. Jones, Hercules Powder; secretary, Ralph O. Keefer, Aluminum Company of America, Pittsburgh.

Ends with a "Bang"

Chemical Salesmen's Association of the American Chemical Industry brought to a close a most successful golf tournament with a final party at the Pomonok Country Club, Flushing, L. I. Over 120 members and guests golfed, dined and stayed for the Broadway entertainment.

Charles E. Kelly proved to be the champion of the group. Other prize winners were: 2nd low gross, Al Alvarez; 3rd low gross, Hibben Ziesing. Handicap, class A: 1st, R. C. Quortrup; 2nd, W. D. Merrill; 3rd, H. Herrmann. Handicap, class B: 1st, George Bode; 2nd, "Al." Higgins; 3rd, John Eldridge. Members, kickers: 1st, Oscar Lind; 2nd, "Hal" Pryor; 3rd, "Sid" Moody.

An Unusual Inspection Trip

Returning A. C. S. members mention as one of the highlights of the recent San Francisco meeting visit to the Italian Swiss Colony of grapegrowers and vintners at Asti. Visiting chemists were guests at a typical Italian dinner in the open, supplemented by the choicest of wines. Members who remembered the similar trip 10 years ago suggested the return engagement.

Rubber Chemists to Meet

N. Y. City and Chicago Rubbers Groups announce next meeting dates. New York Rubber Group will meet in the Building Trades Employers Association clubrooms, 2 Park ave., on Oct. 11. Chicago Rubber Group, meeting jointly with the Chicago section A. C. S., will meet at dinner Oct. 25 in the Stevens Hotel.

Association Notes

"Cosmic Chemistry" is the subject of Dr. Donald H. Menzel's address, the 1st of the season before the Midland Section of the A. C. S.

Art Division of the American Ceramic Society will hold a series of round table discussions Friday and Saturday forenoons, Oct. 25 and 26, at the Onondaga Hotel, Syracuse, N. Y.

A. I. Ch. E. accepts invitation of Institution of Chemical Engineers to visit England at the time of the Chemical Engineering Congress.

"Chemurgic" Fellowships

"Chemurgic" fellowships are to be established in the 48 state agricultural colleges if present plans are carried through. They will provide for postgraduate research work along the lines laid down in the program of the new "farm chemurgic" movement.

Companies

¶Toledo Synthetics Forms Important Tie-Up with I. C. I., Canadian Industries and Montecatini—Cyanamid's Golf Tournament—Du Pont Sponsors Educational Radio Program—Other Doings

Toledo Synthetic Products will exchange technical and commercial data on molding compounds and laminated products made from urea-formaldehyde resins or urea-thiourea formaldehyde resins with British Imperial Chemical Industries for the next 10 years, according to a contract just signed. Participants have agreed also to grant each other free licenses under the patents which are already or may be secured under the life of the contract.

Same agreement extends to Montecatini. A separate agreement has been signed with Canadian Industries, Ltd., appointing that concern sole agent for Plaskon, a plastic material, in Newfoundland and Canada.

James L. Rodgers, Jr., president of Toledo Synthetic Products, Inc., commenting on the agreement, expressed the opinion, that "it will prove vastly beneficial scientifically as well as commercially to the 2 concerns."

Director of the plastics division of I. C. I., Major A. E. Hodgkin, and his technical assistant, B. J. Wood, recently spent some time in this country. The latter visited Toledo and stayed 6 weeks studying the processes used by the company there. Information obtained from the American concern will be turned over to Mouldrie, Ltd., a subsidiary of I. C. I., engaged in the manufacture of urea formaldehyde and urea-thiourea formaldehyde molding powders in Great Britain.

Plaskon, the material manufactured by Toledo Synthetic Products, Inc., is a molding powder used to manufacture countless articles. Its recent use to make the housing of retailers' scales drew widespread interest and attention, since this largest of plastic molds represented the first use of plastics to replace metals in heavy machinery. It is commonly known as "molded color."

A Day in the Country

Cyanamid's annual golf outing held Sept. 21 at the Engineers Club at Roslyn, L. I., attracted close to 100. Particularly keen was the competition between the 10 teams competing for the Team Trophy donated this year by H. L. Derby, president of Cyanamid & Chemical, and won by the "Kalbfleisch" group, consisting of P. M. Dinkins, M. R. Brown, J. M. Kingston and T. Melnick.

Low gross (The Calco Trophy) went to J. J. Rogers of the Waterbury, Conn., plant with a 77; low net (The Golf Committee Cup) to G. W. Paterson with

a 97-32-65. Kicker's Handicap Prizes were won by L. A. Watson, E. A. Guenther, J. L. Schroeder, and J. M. Kingston, while the money prize for low putts was captured by M. R. Brown.

The Nation Chemical Conscious

Du Pont officials have approved a campaign designed to bring the importance of chemical research to the average citizen. A radio program over CBS Wednesday evenings from 8 to 8:30, and black and white bleed pages in the *Saturday Evening Post*, will be used.

Diamond vs. Scohy Glass

Diamond Alkali's tennis team (Pittsburgh main office) defeated a team from Scohy Sheet Glass at Sistersville, W. Va., on Sept. 15. Following the match the Diamond Alkali team were guests at the annual picnic of the Scohy Club. J. D. Mattern captained the Alkali team. George H. Dahlin of the Diamond sales department has donated a cup as emblematic of the matches in the future.

Unusual Metals and Salts

Pre-Metals, Inc., Utica, N. Y., is organized to manufacture salts and solutions for plating palladium and gold. Harrison S. Sweet is president; Leo J. Oster, treasurer; Daniel Wetzel, secretary; Mitchell I. Liebenson, vice-president and general manager. Works and laboratories are in Utica, under the control of Daniel Gray, chief chemist. A New York office has been located at 120 Wall st. with Mr. Liebenson in charge. Company is interested in buying precious metals and ores in all forms.

Heard and "Overheard"

Catalin Corp. August sales amounting to 375,000 lbs. of "Catalin" were largest in company's history. First 8 months' sales for '35 showed 30.4% gain over same '34 period.

Over 250 attended the 6th annual du Pont Company's All-du Pont sports tournament (golf and tennis) held late last month at the du Pont Country Club.

General By-Products Co. is organized in Philadelphia for reclamation of chemicals and by-product production. William Rhue, 1841 N. 6th st., Philadelphia, is in charge of new organization.

Paper Makers Chemical reports loss of $11,000 chemical stock. Private detectives have been retained in effort to locate missing chemicals.

Wasatch Chemical, Salt Lake City, handles local stocks of Albek & Felton chemical lines.

Firestone Tire & Rubber severs connections with Rubber Manufacturers' Association, aftermath of the scrapping of NRA code by the industry.

Solventol Chemical Products, Detroit, reports a 300% increase in business so far this year over the same period of '34. It is equipping a new division at its plant at 970 E. Vernor Highway for producing laundry specialties.

New members in Chemical Section, National Safety Council are Ducktown Chemical & Iron, Isabella, Tenn., and Cliffside Mills, Cliffside, N. C.

Ecclestone Chemical, Detroit, reports unusually large orders from automobile manufacturers and sugar refineries in the Detroit area.

Golfers from du Pont and Hercules clashed last month at the du Pont Country Club.

Corporate name of Fansteel Products Co., Chicago, has been changed to Fansteel Metallurgical Corp.

Merrimac Chemical (Monsanto subsidiary) will make synthetic resins for the paint and varnish trade.

With the Equipment Companies

For the most outstanding advertising campaign of the year in the field of metals Republic Steel was awarded 1st prize by judges at the 13th Annual Conference of the National Industrial Advertizers Association held at Pittsburgh on Sept. 18, 19 and 20.

S. A. Knisely, advertising and sales promotion manager of Republic states that the prize-winning campaign was created and placed by G. M. Basford Co., industrial advertising agency, with offices in New York and Pittsburgh.

Tech Laboratories, with a factory located at 703 Newark ave., Jersey City, is now engaged in manufacturing a line of standard and special precision resistance instruments and allied products, for industrial and laboratory use.

Exclusive distribution of the Bausch and Lomb Electroplaters' Microscope in the electroplating industry has been taken over by Hanson-Van Winkle-Munning, Matawan, N. J. Inexpensive, simple and rugged in construction and easy to operate, this microscope makes it possible for the plater to determine the exact thickness of the plate at any desired place.

American Optical obtains a substantial interest in Spencer Lens of Buffalo. Latter will be operated separately.

The Titusville Iron Works, Titusville, Pa., secures sale and manufacturing rights for master line of scrubbers, mixer heads, and separators, extensively used in chemical, petroleum, and allied industries. Rights do not apply to California.

Fires

Armour & Co., 31st & Benson sts., Chicago, $5,000, Aug. 31st.

Windsor Wax, Hoboken, N. J., fire and explosion, $10,000 minimum damage, 3rd.

Chemical Coated Products, Attleboro, Mass., by explosion, $6,000, Aug. 29th.

Plants

Local fire officials visit Stauffer Chemical's Dobb's Ferry, N. Y., plant, inspecting plant operation in case they must fight a plant blaze in the future.

Columbia Chemical employees in Akron, Ohio, protest recently installed "speed up" system, alleging many old time employees are on part time work as result.

Jacques Wolf & Co. installs adsorption tower to eliminate disagreeable odors issuing from Carlstadt, N. J., plant.

Traffic

¶I. C. C. Ruling on Kaolin Rates Upheld in Court Test—

Federal Judges Oliver B. Dickinson of Philadelphia and John P. Nields of Wilmington on Sept. 25 dismissed complaint filed by the principal railroads of the East against an I. C. C. order fixing maximum rates on china clay, or kaolin, shipped from southern points to New England.

Opinion ruled against the bill for want of equity. Opinion states that the I. C. C. is a rate-making body, and not the court. Court, the opinion added, can enjoin only when an order by the commission fixing rates is without evidence to support it and "thus was, in the accepted phrase, arbitrary or capricious, or was based upon the application of an unsound principle of law."

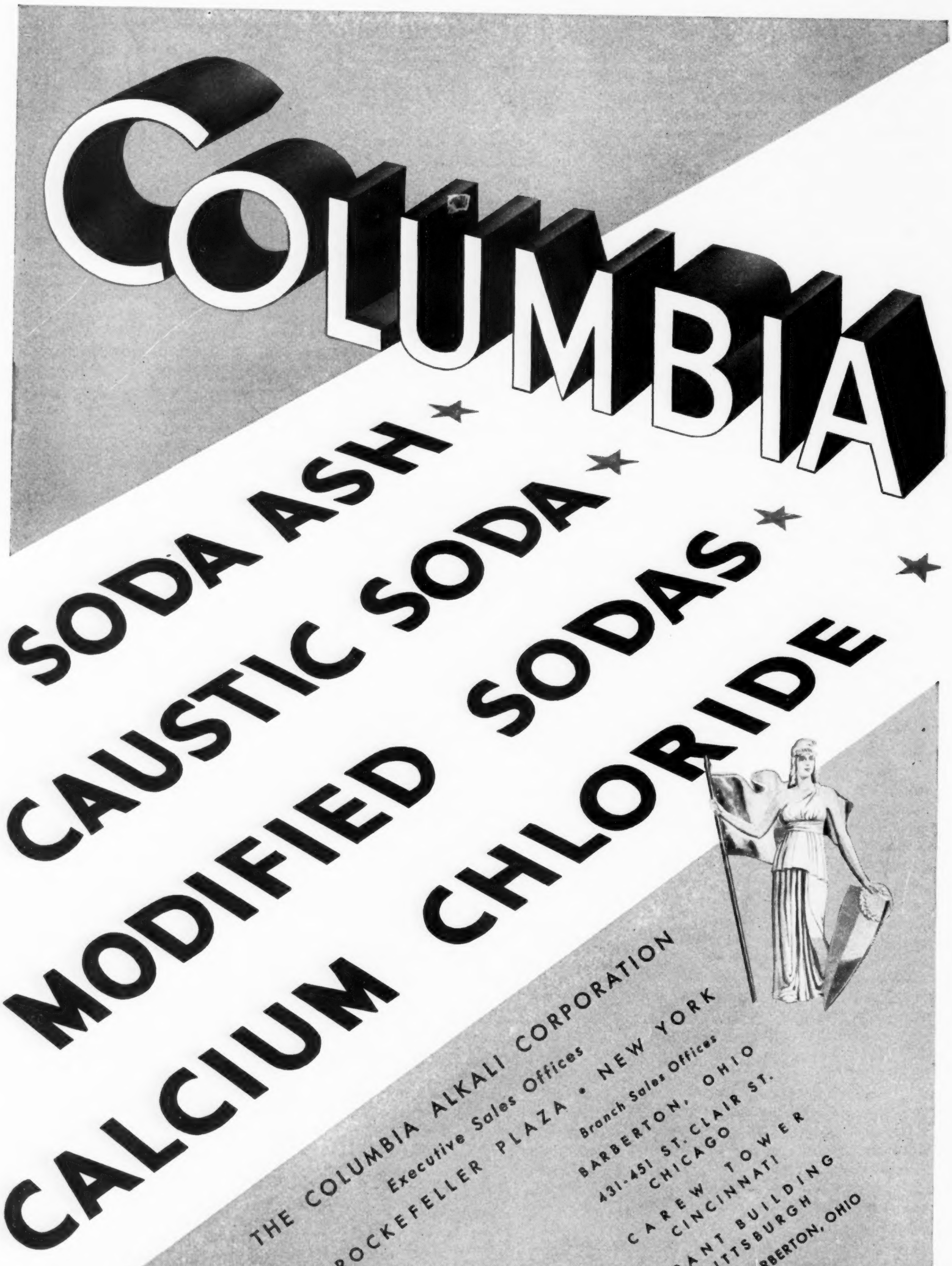
Circuit Court Judge Joseph Buffington, in a dissenting opinion, said the I. C. C. in this case had not complied with the standard of requirements.

Thirty-two railroads were complainants in the suit. They sought a reversal of barge-rail rates originally fixed by the commission upon application of the American Barge Line.

Construction

¶Leading Chemical Equipment Manufacturer Sees More Prosperous Conditions Ahead—Estimate of Near Future Construction — Additions and New Projects Reported—

Irvin F. Lehman, president of the Blaw-Knox Co., manufacturers of heavy equipment, on the eve of sailing for an extended European trip, reports that he is optimistic on conditions in this country, stating that the lack of improvements and rehabilitation in industry since '30, and the new processes developed in the past few years, are building up a demand for industrial spending which is at the


COLUMBIA
SODA ASH
CAUSTIC SODA
MODIFIED SODAS
CALCIUM CHLORIDE
THE COLUMBIA ALKALI CORPORATION
Executive Sales Offices
30 ROCKEFELLER PLAZA • NEW YORK
Branch Sales Offices
BARBERTON, OHIO
431-451 ST. CLAIR ST.
CHICAGO
CAREW TOWER
CINCINNATI
GRANT BUILDING
PITTSBURGH
Plant at BARBERTON, OHIO

point where actual orders are being placed.

Bright Outlook for '36

Equipment companies' executives interviewed recently are optimistic over chemical plant construction during the next few months. Substantial increases in outlays by chemical manufacturing concerns for expansion purposes are confidently expected. Earnings of the chemical producers have remained at relatively high levels during the depression, when compared with other industrial groups. Accordingly, the large majority of chemical producers are in good financial shape to finance new plants and equipment for the introduction of an impressive array of new products that are now past the experimental stage. In addition, the high rate of obsolescence due both to the rapid rate in technical advances and the generally corrosive type of materials handled leaves many plants sorely in need of renovation. Contracts awarded for construction of chemical plants during the 1st 8 months of '35 are reported to be ahead of last year by almost 65%.

Construction Briefs

National Mortar & Supply remodels its Gibsonburg, Ohio, plant. $150,000 expenditure includes construction of 5 new steel bins and a lime pulverizing unit.

Du Pont awards contracts for one-story plant on Buffalo ave., Niagara Falls.

Cincinnati Chemical engages Tietig & Lee, architects, to prepare plans for 2-story addition to its Norwood, Ohio, plant.

Construction on the Martinsville, Va., Powhatan Converting Works goes forward. Plant should be ready for dye production by Nov. or Dec. 1st.

Penick & Ford awards contracts to George J. Glover & Co. for alteration and extension of its New Orleans boiler house.

Lowe Brothers, Dayton, Ohio, paint manufacturer, will remodel its building on E. 3rd st. and Wayne ave. at estimated cost of $100,000. Remodeled building will house executive offices, formerly located at 450 E. 3rd st.

To meet increasing business, Victor Fertilizer plans enlargement of its Gaffney, S. C., plant. E. C. Bruce, former Planters Fertilizer executive, is new general manager of the plant, and S. Simpson, formerly with Swift Fertilizer, will be plant superintendent.

New $100,000 solid CO_2 plant nears completion at Wellington, Utah. Carbon Dioxide & Chemical, Seattle, Wash., is in charge of operations. W. H. Bintz & Co., Salt Lake City, will be sales representative.

Thirty years' destruction was repaired in 20 days at the Diamond Crystal Salt plant at St. Clair, Mich., recently, after decomposition of the crumbling roof made further operations hazardous. The Austin Co., Cleveland construction firm, was in charge.

Guggenheim Bros., New Britain, Conn., add small building, housing 6 separate units, to their plant. Work to perfect new chemical sewage disposal system is in progress.

Continental Can will erect a 3-story can manufacturing plant adjacent to its present plant on South Ashland ave. in Chicago.

Expositions

¶Biggest Chemical Exposition Yet—Is the Outlook Now for December Show — Metals and Plastics are On Review—

Greatest industrial pageant of chemical achievement since the depression is the reward in store for those planning to attend the 15th Exposition of Chemical Industries, which occurs in Grand Central Palace, N. Y. City, Dec. 2 to 7. Outstanding success of the last, held in 1933, when the condition of business was less firm, warrants prediction that this year's Exposition will reach a high point in terms of results, both to exhibitors and audience.

Chemical industries never stand still, and so the exposition of them is perennially a subject for rich new chapters to read and exhibits to see. At the Exposition in '33 there were 244 companies and organizations exhibiting, and the registration of attendance was 33,000. Exposition this year is divided into the following classifications: Chemicals and Chemical Products; Plastics, Molded Products, and Lacquers; Laboratory Equipment and Supplies; General Equipment; Instruments of Precision; Containers and Packaging Equipment; Brewing, Distilling, and Bottling Equipment; Materials Handling Equipment; Raw Materials, Natural Resources and Industrial Opportunities; and Educational Exhibits.

Permanent Exhibit of Metals and Plastics

The new International Building in Rockefeller Center houses the first permanent exhibition of metals and plastics in this country. Metal Products Exhibits, Inc. are the sponsors of the movement, which is designed to provide the public with a visual presentation of metallic and plastic materials and parts as used by industry, and to enable manufacturers in these industries to take full advantage of this method of selling. Outstanding feature is a wall of metal finishes and electroplates of all important commercial types, displaying also colored and chemical finishes, lacquers and lacquer enamels.

Personal

¶Dorr in South Africa—Daughter of Prominent Chemical Executive is Married—New Members at the Chemists (N. Y.) Club Reported—

Dr. J. V. N. Dorr, president of the Dorr Co., is visiting South Africa, accompanied by Mrs. Dorr. He will address several of the technical societies, and visit a number of plants where Dorr equipment has recently been installed. Dr. Dorr and the former Miss Virginia Neil Koone were married Aug. 20. They plan to return about the middle of December.

From the "Percolator"

New members recently elected to The Chemists Club include: Thos. J. Starkie, of Wishnick-Tumpeer; Wm. A. Broadfoot, general manager for The Aspinook Co.; Paul J. Carlisle, Chemical Extension Division, du Pont; Lincoln Lothrop, Calco; Alfred T. Taylor, Taylor Salt president; Howell W. Evans, Solvay Amer. Investment; Enrique L. Luaces, Sanchez, Fernandez U. S. representative, and consultant for Acticarbone, Inc., of N. Y. City on activated carbon and solvent recovery plant problems; and John Neil Kennedy, Muralo Co. research chemist.

Married

Miss Helen Huntington Hooker, daughter of Elon H. Hooker, president, Hooker Electrochemical, to Ernest O'Malley of Dublin, Ireland, on Sept. 27. Mrs. O'Malley was maid of honor at the marriage of the former Miss Blanchette F. Hooker, to John D. Rockefeller, 3rd, in 1932. Mr. O'Malley is a former member of the Dail Eireann and is now studying medicine in Dublin.

Miss Halbach Introduced

Miss Mary E. Halbach, daughter of Mr. and Mrs. Ernest K. Halbach, made her debut at a dinner at her parents' home in Short Hills, N. J., on Sept. 17. The dinner was followed by a dance at the Short Hills Club. Mr. Halbach is president of General Dyestuff.

Recovered

Miss Lydia du Pont, in company with her parents, Mr. and Mrs. A. Felix du Pont, Sr., returned to the du Pont estate, "Elton" on Sept. 16. Miss du Pont was taken ill earlier in the month at Kingston, Jamaica, and was first thought to be suffering from a tropical fever.

W. T. Wright, vice-president, F. S. Royster Guano, Norfolk, Va., and vice-president of the N. F. A., is now in the Norfolk Protestant Hospital where he is recovering from an operation performed Sept. 21, for a thyroid condition.

S. D. Earnest, Carson Naval Stores of Savannah, is in Violet Hill Sanatorium, Asheville, N. C., undergoing

treatment for injuries to his lungs received in an auto accident several years ago.

A Son to the Alsops
A son, Edmund Bell, to Mr. and Mrs. Samuel Alsop. Mr. Alsop is president of Alsop Engineering.

Robbed
Harold W. Anderson, du Pont dye chemist at the Deepwater plant, was held up in his home. Robber, frightened, got away before he obtained any valuables.

Of More than Passing Interest

Mrs. Willard H. Dow was hostess at a tea on Sept. 7 at the Midland Country Club to 150 women of Midland and surrounding towns.

Godfrey L. Cabot, of Boston, endows Norwich University, Northfield, Vt., with professorship in air traffic, regulation, and transportation.

William A. Hart, du Pont executive, speaks before Advertising Women of New York dinner at the N. Y. Advertising Club.

Horace Bowker reports that Lt. Col. Baxter, who formerly headed the NRA division in which the fertilizer industry was grouped, is now at Springfield Armory, Springfield, Mass.

Allan K. Thayer, C. K. Williams Akron representative, is new Portage Camera Club president.

Dow's Dr. John A. Gann celebrated the 15th anniversary of his starting on Dowmetal development by telling the Midland Lions last month the story of the early struggle.

H. A. Swales, Spencer Kellogg & Sons Chicago manager, returns to work after a serious auto accident in June.

D. Clinton Grove, Blaw-Knox, presided at the recent meeting of the National Industrial Advertisers Association held in Pittsburgh.

Dr. Allan F. Odell, du Pont chemist and executive, buys a new residence at 275 Roseland ave., Essex Fells, N. J.

Imperial Color Works salesmen present gold watch to Adolph Fuchs, honoring his 34th anniversary with the company, at their annual sales convention.

Obituaries

¶*Germany Loses One of Its Best Known Chemists—Helped Found I. G.—*

Dr. Leo Gans, 92, founder of a small chemical firm which later developed into the huge I. G. on Sept. 14. Dr. Gans, the Nestor of the German chemical industry, was an honorary citizen of Frankfort and a well-known philanthropist. Until recently he was an active member of Farben's board of directors.

Other Deaths of the Month

Thomas J. Maxwell, 73, Tennessee Extract secretary-treasurer, of acute heart dilation, Nashville, Tenn., 2nd.

William Hutton Blauvelt, former Semet-Solvay general manager, on the 13th. Mr. Blauvelt was an important contributor to the U. S. Coke by-product industry.

John Sharkey Carroll, 64, prominent in fertilizer industry, at his home, on the 15th.

John Francis Ryan, 70, former Ontario Paper general superintendent, following long illness, 16th.

Charles F. Black, 56, Merck & Co. cashier, after long illness on the 22nd.

Clifford G. Bockey, N. J. Zinc Co., following an operation, 25th.

Personnel

¶*Chilean Nitrate Sales Reports Changes — Corey Resigns from Vanadium—Others in New Fields*

Chilean Nitrate Sales Corp. announces changes in staff and organization. G. E. Petitt, formerly with V-C, is new vice-president, O. W. Tuckwood is traffic manager. New sales offices in Montgomery, Ala., and Columbia, S. C., will be under supervision of Fred P. Bryan and W. T. Hart, respectively. E. J. Shaw takes charge of recently opened Pacific coast sales office.

Rumors Prove True
Rumors that Alfred A. Corey, Jr., would resign from the presidency of Vanadium were confirmed Sept. 20 when his resignation was accepted by the directors. At the same time the resignation of Dr. B. D. Saklatwalla, vice-president and technical head of the company, was accepted.

A. A. C. Directors
American Agricultural Chemical elects following directors for one year term: Horace Bowker, Louis H. Carter, G. C. Clark, John F. Dulles, Charles Heyden, George C. Lee, and Archie F. Stock.

Richard Goes to St. Louis
R. F. Richard, general manager of sales of the Swann Products Division of Monsanto, now makes his headquarters at the St. Louis offices of the company instead of in N. Y. City where he has been located.

McGovern Covers Pittsburgh
C. F. McGovern of Cyanamid and Chemical's insecticide division is being transferred to the industrial chemical division, and will handle sales in the Pittsburgh area, making his headquarters for the time being at the Bridgeville, Pa., plant.

Briefly Reported

Paul K. Alvord, Cleveland chemist, joins sales staff of J. C. Drouillard, Cleveland paint and varnish producer.

Thomas F. Callahan is now with Wishnick-Tumpeer in the N. Y. City office at 295 Madison ave. Mr. Callahan was formerly in charge of field operations for Palmer Gas Products.

Henry Interdonati severs his 14-year connection with Charles L. Huisking to join Enequist Chemical, Brooklyn manufacturer and distributor.

R. C. Rollins, prominent paint technician, is now with Murray Oil Products' technical staff, with headquarters at Philadelphia. He visited the company's coast branch last month.

William R. Veazey, former chemical engineering head at Case School of Applied Science, is now on Dow's executive staff at Midland.

Industrial Service Laboratories, textile solvents and industrial soaps producer, Utica, N. Y., announces J. Milton Edelstein is now a partner in the firm.

Stephen R. Kiehl becomes Billings-Chapin, Cleveland paint producer, plant superintendent, following his resignation as vice-president of Creo-Dipt, North Tonawanda, N. Y.

J. D. Walker joins Corning Glass research staff.

Lawrence Philips resigns as Valspar president and director.

Babcock & Wilcox Tube appoints R. P. Kilsby western sales manager, with offices in Chicago.

Arthur D. Camp, formerly with the Thomas & Hochwalt Laboratories, Dayton, Ohio, is now Data dept. staff librarian for the Dorr Co.

Frank R. Blood, former U. of Denver instructor, goes to du Pont's Haskell Laboratory of Industrial Toxicology as junior biochemist.

Howard L. Gerhart joins Standard Oil of Indiana research staff.

Henry J. Kehe is on B. F. Goodrich's chemistry and chemical engineering staff at Akron.

George A. Fisher opens offices in Circle Tower, Indianapolis, as consultant in chemical engineering, food and nutrition. He was Van Camp's laboratory director for 23 years.

P. & G. transfers G. S. Botsford from Ivorydale to Baltimore where he will be plant chemical engineer.

E. C. Lathrop heads new Crown Zellerbach Development & Research Dept. with headquarters at the Crown Willamette Paper Camas (Wash.) mill.

D. F. Jurgensen, former Pure Oil research chemist, joins U. S. Gypsum research staff in Chicago.

Frank B. Burns, formerly on Barber Asphalt's research staff, will do research work on roofing materials and specialties at U. S. Gypsum's Chicago laboratories.

Benjamin Kapp, former Washine-National-Sands chief chemist, is new M-G-M Studios' technical advisor.

Standard Oil of Indiana Research Dept. employs George G. Lamb, former N. Y. U. instructor, as chemical engineer.

Robert M. Reed, P. & G. research chemist, and Mrs. Reed return to Ivorydale from U. of Washington where Mr. Reed has completed work for his doctorate.

Carnegie Tech appoints Alexander L. Feild, former Rustless Iron consultant and Alloy Research president, as professor of metallurgy.

Allen M. Peairs is new Ralph M. Parsons Co. southwest sales representative after 5 years as consulting engineer to the same company.

Robert R. Sherrill, recent Illinois Univ. graduate, is with Ferro-Enamel, Cleveland, Ohio.

Dr. W. C. Rueckel, former National Paving Brick Association's research bureau director, goes to Koppers Construction, taking charge of refractory department.

Moro P. Landis retires as General Chemical's Pulaski, Va., plant superintendent after 30 years active service.

W. J. Lattimore resigns from C. K. Williams, Easton, Pa., research staff.

Henry J. Kehe joins chemistry and chemical engineering staff at B. F. Goodrich's Akron plant.

Dr. Ernst A. Hauser, internationally known rubber technical expert, returns from Austria to become M. I. T. associate professor of chemical engineering. He has been retained by R. T. Vanderbilt Co. and Dewey & Almy Chemical in an advisory capacity.

Ignatius J. Wernert, formerly with R. & H. division of du Pont, is appointed instructor at Niagara University, Niagara Falls, N. Y.

Clifford L. Heaslip, formerly with Siemon & Elting, dry color producers, enters Wishnick-Tumpeer's N. Y. City office.

Joseph Breckley, formerly associated with noted rubber companies, is a special representative in Titanium Pigments eastern sales division.

Stewart Berkshire, El Paso, succeeds Arthur J. Mellott as deputy commissioner of Internal Revenue, in charge of the alcohol tax unit. Mr. Mellott succeeds to position on the Board of Tax Appeals.

Landy Promoted

Du Pont appoints John L. Landy, advertising manager of the R. & H. chemicals department, to succeed the late John A. Lyter.

Alex Sinaiko & Sons, Springfield, Ill., begins operation of a soy bean mill, operating as Illinois Soy Products branch.

George Senn, Philadelphia dealer with offices in the Bourse, now represents Menhaden Fish Products of Baltimore.

"The Gangplank"

¶Carothers Will Be Honored in England — Others Reported on the Steamship Lists—

Dr. Wallace H. Carothers, du Pont research chemist, sailed Sept. 17 in the *Bremen* for England, where he will address the Faraday Society, leading organization of chemists and scientists. Dr. Carothers, who played an important part in the development of "Duprene," or synthetic rubber, will read a paper on "Giant Molecules," and refer to the scientific formulation of synthetic rubber.

H. W. Remington, in charge of Colgate-Palmolive-Peet foreign department, returns from world tour to report substantial increase in foreign market trading. Mr. Remington plans another tour of still unvisited foreign markets.

Singing the praises of the Swiss, Robert A. Faesy of Truempy, Faesy and Besthoff, N. Y. City chemical dealers, is back from an extended trip to continent. He was accompanied by his family.

Warner D. Huntington, in charge of Cyanamid's fertilizer division, returned in the *Normandie* on Sept. 12.

John S. Reese, a son of Dr. Charles L. Reese, sailed in the *Conte de Savoia* for an extended trip through Italy and Greece and down the Dalmatian Coast.

Samuel C. Zirlin, Marine Laboratories sales manager, leaves for west coast to visit various company sales agencies at main Pacific coast seaports. Mr. Zirlin plans to stimulate further interest in "Softwater" products during this trip.

Mr. and Mrs. Brand (he is secretary of the N.F.A.) returned from a vacation spent in Ireland, Scotland, England, Belgium, and Germany in the *Europa*. Mr. Quiggle, who accompanied them through Ireland, Scotland, and England, returned on the previous sailing of the same ship. All reported a most enjoyable time, barring Mr. Quiggle's illness.

Washington

¶Oil Compensatory Taxes Go Into Effect—Ruling on Edible Sunflower Oil Reported—

The compensatory taxes on various oils, passed in the last session, became effective Sept. 30. The tax of 3c per lb. will apply on the quantity of the following crude materials used in the production of manufactured products: Whale oil (except sperm oil), fish oil (except cod oil, cod-liver oil and halibut oil), marine animal oil, sesame oil, palm oil, palm kernel oil, sunflower oil and coconut oil. It has been assessed on such oils for 3 years, and the new law is designed to overcome evasions by manufacturer prior to importation.

In the case of products containing coconut oil not originating wholly in the Philippine Islands and not made from materials entirely the growth or production of the islands there will be an additional tax of 2c per lb on the quantity of coconut oil. It will be assessed in all cases where customs officials are not satisfied of the origin through foreign shippers' declarations on documents covering a consignment. Revenue from the special tax will be for account of the Philippine Government.

Later it was learned that refined edible sunflower seed oil is not subject to tax under Section 402 of the Revenue Act of 1935 in the opinion of officials of the Treasury Dept.

Trade Commission

¶N. F. A. Seeks Self-Regulation for Fertilizer Industry Under F. T. C.

N. F. A. reports progress in formulating plans for industry self-regulation. When complete, board of directors will pass upon them before they are presented to the Federal Trade Commission. So far F. T. C. has given no indication of policy which would serve as a general guide in the formation of self-government plans by industry.

Stipulation Signed

False and misleading advertising practices will be discontinued by the National School of Exterminating, Springfield, Mass., under a stipulation entered into with the Commission.

Waxes

During recent years the United States has purchased practically the entire Cuban output of beeswax, according to a report from Habana. Approximately 150 metric tons were shipped to the U. S. during the 1st 5 months of '35.

Important Price Changes

ADVANCED	Sept. 30	Aug. 31
Candelilla	\$0.16	\$0.15½
Carnauba, No. 3, N. C.	.38½	.37½
Japan	.08	.07½
DECLINED		
Bayberry	\$0.17½	\$0.20
Carnauba, No. 2, yellow	.47	.48
No. 2, N. C.	.41	.41½

Story of Nickel Filmed

Story of the production and use of nickel is pictured in a new 2-reel silent educational motion picture film recently prepared under the supervision of the Bureau of Mines in cooperation with an industrial concern.

RUST-EETER

NOW AVAILABLE IN AMERICA! A Revolutionary Method for Protecting Ferrous Metal Surfaces From Ravages of Oxidation

CHEMICAL and PROCESS INDUSTRIES' PLANT MANAGERS, MAINTENANCE MEN--Do you know that rust itself may now be used to protect iron or steel from further oxidation? RUST-EETER PAINT, made on a chlorinated rubber base, converts the rust chemically into a pigment which is incorporated into the paint body. Expensive cleaning is eliminated as all that is necessary is to remove the loose scale. RUST-EETER PAINT provides a tough, protective coating, dries quickly. Second coats (available in CLO-RUBBER colors) can be applied quickly.

CLO-RUBBER IN COLORS

FOR priming and second coats where rust conditions do not exist or for second coats where RUST-EETER is used. These colors are Indian Red, Chrome Green, Gray, White and Aluminum. These paints show unusual resistance to certain corrosives, as follows: 50% ammonium nitrate solution; 5% to 50% sodium hydroxide; 5% to 70% sulphuric acid; 85% phosphoric acid; 5% to 80% lactic acid; 10% hydrochloric acid; 10% nitric acid and such corrosive gases as chlorine, sulphur dioxide and ammonia.

CLO-RUBBER CONCRETE PAINT

STRONGLY adhesive, quick drying, highly resistant to abrasion and chemicals. Leaves a tough coating over the entire surface.

Never before have paints which combine so many qualities been available. Chlorinated rubber, used as a base, has made it possible to get adhesiveness, chemical resistance, mechanical strength and speed in drying, ability to paint over wet surfaces and resistance to combustion. As for weathering, the life is unknown. The oldest test panels are 3½ years old and still going strong. Chemical industries need better specialized paints. CLO-RUBBER paints are the solution of your paint problems.

USE OUR FREE ADVISORY SERVICES

Without any obligation, our engineers will make specific recommendations. Write us fully about your particular problems.

The HARRINGTON PAINT CO., 1632 Collamer Avenue, East Cleveland, Ohio

---

Church & Dwight, Inc.

Established 1846

70 PINE STREET NEW YORK

Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality

Heavy Chemicals

¶September Shipments are in Good Volume—Prices are Firm —Turner Announces a 98% Calcined Carbonate of Potash—Other News of the Industrial Field—

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Acid chromic	\$ 0.14¼	\$ 0.13¾
Copper, metal	.09	.08½
Manganese dioxide	50.00	45.00
Sodium antimoniate	.12½	.11½
Tin crystals	.37½	.37

DECLINED

Acid Stearic, dist., double pressed	\$0.10	\$0.10¾
Sap., double pressed	.10½	.11¼
Triple pressed	.13	.13¾

DEPT. OF LABOR STATISTICS

	Aug.'35	July '35	Aug.'34
Employment *a*	107.7	109.0	110.9
Payrolls *a*	103.3	101.6	96.5
Prices *b*	84.3	84.6	79.2

DATA FOR PROCESS INDUSTRIES

	Aug.'35	July '35	Aug.'34
Explosives:			
Employment *a*	86.5	86.1	90.5
Payrolls *a*	76.9	70.0	72.9
Soap:			
Employment *a*	97.7	99.3	98.6
Payrolls *a*	93.6	94.4	86.1

	Aug. '35	July '35
Exports	\$1,675,000	\$2,151,000
Imports	1,254,000	1,032,000
Crude sulfur, exports	567,000	613,000
Industrial Chemical Specialties, exports	1,162,000	965,000

a 1923-25=100.0; *b* 1926=100.0.

September shipments of industrial chemicals were in even greater volume than either July and August and considerably ahead of September a year ago. Practically all consuming industries showed definite increases with the exception of the automotive and electroplating fields. Particularly pleasing to chemical producers was the continued improvement in the textile and tanning fields. Alkali manufacturers report shipments going to the rayon companies at a very high level.

Somewhat surprising was the increase in chromic at this time, but the producers have indicated that the former prices were out of line with current bichromate costs. Copper metal again advanced ½c in the past month, bringing the domestic price to 9c. Tin crystals were slightly higher with the metal advancing after the slight dip in August.

Outlook for October tonnages is bright. Automotive production is expected to rise sharply from the low of 160,000 units produced in September. With the premier showing of '36 models set for early in November instead of the traditional 2nd week in January the Detroit area is humming with activity. Steady advances are confidently expected in most of the other consuming industries through October and November. No indications have been given by chemical producers as yet as to '36 contract prices but at the moment the picture is one of decided firmness. A late contract season appears likely.

Standard Wholesale Phosphate & Acid Works is awarded a 10-year contract by Kebs Pigment, a subsidiary of duPont, to furnish sulfuric, according to an official of the Standard Wholesale Phosphate Co.

A 98% Potassium Carbonate

Joseph Turner & Co., N. Y. City, reports that it is now marketing a very high grade calcined carbonate of potash with a 98% minimum, manufactured by Niagara Alkali, first producer in this country of caustic potash and carbonate of potash.

Turner & Co. have been marketing carbonate of potash in the liquid form for over a year. Walter Merrill, Turner sales manager, states, however, there are many instances where consumers prefer a calcined product, and for this reason Niagara Alkali chemists have worked towards a calcined product of much higher quality than the standard commercial 85% material.

Sulfur by Chlorination

A patented chlorination process will be utilized by Aldermac Mines, Ltd., Toronto, Can., for the manufacture of pure sulfur on material too poor to otherwise work, providing an experimental plant set up at Niagara Falls proves successful. Cost of producing sulfur by this method, pyrites not included, is said to be under \$8.30 a ton. With a copper price of 9c, pyrites could, it is claimed, be delivered to the sulfur mill free of cost. Sulphide, Inc., owner of the chlorination patent, is reported to have contracts with Rio Tinto for an exchange of information and patent rights. Aldermac Mines reports contracts with 4 paper pulp plants for their sulfur requirements beginning in 1937.

Just an Annual Event

Once more a bill raising the tax on sulfur production from 75c to \$2 a ton is about to be presented to the Texas Legislature. A similar bill was defeated last session.

T. G. S. Drills at Gulf

Texas Gulf Sulphur has ordered 4 drilling crews to proceed to Gulf, Tex., preparatory to resuming operations in Matagorda County. T. G. S. shut operations in Gulf several years ago.

Solvay's Houston Office

Solvay Sales opens branch sales offices at Houston in the Petroleum Bldg., and at Charlotte in the Johnston Bldg.

Natural Salt Cake Producer

Salt Lake Sodium Products begins sodium sulfate production at Salt Air, Utah, plant. New company owns 700 acres of Great Salt lake shore lands.

Opportunity to Sell Chemicals

First section of Buffalo's addition to its filtration plant has been placed in operation.

Fine Chemicals

¶Fall Seasonal Items are Moving in Satisfactory Quantities—

Call for winter seasonal items in the fine chemical and pharmaceutical fields increased seasonally in September. In addition, most other items moved out in satisfactory volume. The surprise market moves were the sharp decline in U. S. P. zinc oxide and the 2c advance in tartar emetic.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Agar Agar, No. 1	\$0.75	\$0.65
No. 2	.70	.60
No. 3	.55	.45
Cadmium Metal	.85	.65
Menthol	3.45	3.15
Phenolphthalein, U. S. P.	.65	.60
Yellow	.60	.55

DECLINED

Calcium hypophosphite	\$0.62	\$0.65
Tartar emetic, U. S. P.	.28	.26
Tech.	.24¾	.22¾
Potassium hypophosphite	.72	.75
Sodium hypophosphite	.67	.70
Theobromine alkaloid	1.85	2.00
Sodiosalicylate	1.65	1.75
Zinc oxide, U. S. P.	.08	.12¾

DEPT. OF LABOR STATISTICS

	Aug.'35	July '35	Aug.'34
Drugs and Pharmaceuticals prices *b*	73.8	74.0	72.7
Employment, Druggist's preparations *a*	96.7	95.1	98.6
Payrolls, Druggist's preparations *a*	91.4	92.3	89.9

a 1923-25=100.0; *b* 1926=100.0.

Chilean Iodine Exports

Iodine exports from Chile amounted to 502,000 kilograms during '34-'35 against production of 587,000 kilograms during the same period. Production continues in private hands but all sales and exports of iodine are regulated by the Nitrate and Iodine Sales Corp., a monopoly in which the Chilean Government has a controlling interest. Monopoly is reported to be making studies relative to the production of other products including pure potassium nitrate, sodium iodine and iodate, according to reports from Santiago.

New Peroxide Producer

Peroxide Chemical, St. Louis, organizes Herb-Verdi Co., separate Pacific coast manufacturing unit, in San Francisco.

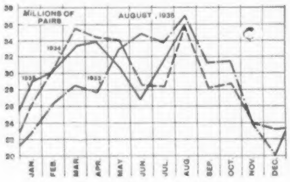
N. Y. Employment

N. Y. State factory employment in chemicals, oils, paints, etc., showed no change between July 15 and Aug. 15.

Textile and Tanning Chemicals

¶*Tanners and Shoe Manufacturers Increase Schedules—Textile Industry Continues Recovery—Rayon Production at Peak—*

August shoe production figures (35,985,487 pairs total) was greatly in excess of the 32,000,000 total forecasted earlier in September by the trade.



Trend in Shoe Production.

This compares favorably with the total of 31,687,124 pairs made in July of this year and with the 35,624,360 pairs produced in August of '34. Nevertheless, production so far this year is 0.6% behind the total for the corresponding period of '34.

Tanners have been substantial buyers of actual hides lately, inspired by the excellent domestic demand for leather. At the recent shoe and leather show, reports indicated that tanners had more business than they wanted to book at existing prices.

Rayon Plants Busy

Rayon shipments for the month just closed reached the peak for this year, surpassing the excellent marks attained in August and January, according to reports in the market. As a result, it is now confidently expected that shipments for the year will achieve an all-time record.

Increased Chemical Demand

With further expansion in practically all divisions of the textile industry and with tanners increasing hide purchases a definite improvement in the call for most textile and tanning chemicals was reported. Albumen, egg, and egg yolk both moved into higher channels. Additional interest was centered in these products last month when trading in frozen egg futures was initiated on the N. Y. Produce Exchange.

Chemicals Used in Rayon

Rayon industry is 25 years of age. U. S. present plant capacity is estimated at 260,000,000 lbs. This gives the U. S. the lead, with Japan 2nd and Great Britain in 3rd position. Francis A. Adams, editor of the *Rayon & Melliand Textile Monthly*, estimates that to produce 210,000,000 lbs. in '34 the industry spent over $30,000,000 in raw materials such as: wood pulp and cotton linter, caustic, sulfuric, glucose, sodium sulfide, sodium nitrate, ammonia, acetone, acetic anhydride, and acetic acid. Same authority estimates that in the last 10 years the rayon industry has bought $42,000,000 worth of caustic soda; $22,000,000 worth of carbon bisulfide; $15,000,000 worth of sulfuric; and $14,000,000 worth of acetone, acetic anhydride, sodium nitrate, sodium sulfide, glucose, acetic, alcohol and ether.

Important Price Changes

ADVANCED	Sept. 30	Aug. 31
Albumen, egg, imp.	$ 0.85	$ 0.82
Egg yolk, imp.	.54	.50
Sumac, Italian, spot.	60.00	57.00
DECLINED		
Mangrove bark	$27.00	$28.00

Dyestuff Markets in Review

Dyestuffs shipments to textile plants during the 3rd quarter by American manufacturers reached a larger total than the business in either of the 2 preceding quarters, it is believed in the trade, with fast vat cotton colors, dyes for acetate fabrics and for woolen goods making up the bulk of the increased movement.

Dye sales in the domestic market for '35 as a result are expected to show some gain over '34, when production amounted to 39,600 tons, against 45,900 tons during '33 and the production of 75,000 tons during '29.

Demands that have reached manufacturers recently for wool colors, according to a recent survey made by the textile division of the *N. Y. Journal of Commerce*, offer a feature of the synthetic dye market at this time. A good deal of this business is traced to Government orders for woolen blankets and clothing, which require chrome colors allowing khaki dyeing. For this purpose combinations of olive green, yellow, brown and black are employed, depending upon the specifications.

Dyes for Acetate Fabrics

Dyes for acetate fabrics of the Celanese variety have been in sustained demand throughout the third quarter. As a good deal of this material is used as lining for wearing apparel, blacks, blues and browns have been in request by finishing plants.

World production of synthetic colors is at a record level again after having been reduced during the depression years. London advices point out that the output in the U. S. is still far below the level of '28 to '30 and the high figures for those years also have not been equaled in Great Britain, France or Switzerland. German dye output, however, is running on the '29 level as far as quantity is concerned, and the increased sales of higher-priced colors have not compensated for price reductions.

World dye output amounting to 206,600 tons during '29, had declined to 196,300 tons during '33, but staged a recovery to 206,400 tons during '34. Of this amount it is estimated that some 60,000 tons enter world trade. Value on this tonnage has been placed at around $110,000,000.

Hunt Takes Organon

Stanley B. Hunt, editor of Tubize's *Textile Organon*, has taken over that journal, and has also formed the Textile Economics Bureau, Inc., to furnish statistical data. New publication will be known as *The Rayon Organon*, with offices at 21 E. 40th st., N. Y. City.

Sulfonators Meet

At the Manufacturers' Country Club, Philadelphia, members of the Sulphonated Oil Mfrs'. Association got together for their 1st field day, Sept. 20.

Morning meeting was taken up with a serious discussion of matters affecting the group. Designation of staples was unanimously changed over to the basis of active ingredients in place of the present somewhat misleading designation. A consolidation of "official" methods of analysis of sulfonated oils was approved, and will be printed. A standard form of contract was approved in principle, the details to be settled later. Unfair Trade Practices were discussed. A modest program of publicity and advertising was approved.

New Chemical Specialty Producer

General Oil Products starts production of sulfonated oils, castor oil and neatsfoot oil, in Chicago. William Von Dielingen is production superintendent while A. C. Stephan, Jr., W. F. Stevens, and A. C. Girard handle sales and distribution. Firm will supply tanners in midwest with sulfonated oils.

With the Textile Companies

United Piece Dye Works, Lodi, N. J., wins dismissal of stock investigation as Vice Chancellor Egan urges investigation into filing of complaint by Salvatore M. Scassera, Lodi, N. J., stockholder.

Penn Bleach & Dye Works locates at Jasper and Huntington sts., Philadelphia, with John J. Cabrey, Jr., as manager.

Swiss Bleaching, Union City, and Durham Dyeing, North Bergen, N. J., lease former Hasco Dyeing plant, Weehawken, N. J., where operation will begin following installation of new equipment.

From the Tanning Centers

Leonard Tanning Co. begins operations in old Lennox factory, Berwick, N. H., following extensive additions and repairs.

The Lichtman-Widen Tanning Corp., new elk and sport leathers producer, begins production in Pittsfield, Mass.

Spring Leathers Shown

Tanners Council of America holds spring leathers style show in Waldorf-

Astoria Hotel, N. Y. City, on the 9th and 10th of September. Higher prices for leathers are laid to decrease in killings but should have no effect on price of tanning chemicals.

More Government Starch

H. S. Paine, U. S. Bureau of Chemistry and Soils head, visits Laurel, Miss., to inspect starch plant prior to its reopening for the 2nd season.

Solvents

¶Denatured Alcohol Prices Renewed — Mid-Continent Petroleum Solvents Price Situation Unchanged—

Denatured alcohol prices prevailing in the 3rd quarter were renewed last month for the balance of the year. Some price changes are likely in some of the special formulas due to the changes made in denaturants. Sales of anti-freeze alcohol were in good volume for this period of the season.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
None.		

DECLINED

	Sept. 30	Aug. 31
Pacific Coast Rubber Solvent:		
167-230 i. b. p.	$0.14	$0.16
104-293 i. b. p.	.17	.19

DEPT. OF LABOR STATISTICS

	Aug.'35	July '35	Aug.'34
Petroleum Refining:			
Employment a	112.3	111.2	113.4
Payrolls a	103.0	100.5	97.2

	Aug. '35	July '35
Petroleum & Products:		
Exports	$21,984,000	$24,291,000
Imports	3,720,000	2,788,000

a 1923-25=100.0.

There appears to be little chance of the wide margin in quotations on petroleum solvents from various mid-west producers narrowing in the near future. All efforts made in the past 2 months have failed.

Sept. Consumption Lower

September car production reached a low point with only 160,000 units. Most of the producers are now tooled up for the '36 models and production schedules are being rapidly pushed forward to stock dealers with the new models. Likewise, the Akron tire center is preparing for a busy fall season.

Wins Solvents Contract

Rochester, N. Y., awards contracts to American Mineral Spirits for 35,000 gallons naphtha solvent to be used in garbage reduction.

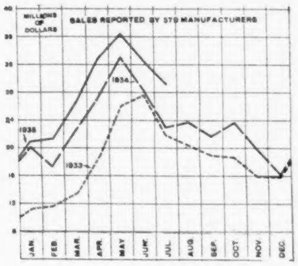
Novel Petroleum Solvents

Chemical Solvents, N. Y. City, is offering petroleum diluents with greatly improved specifications. Additional technical details will be found in the New Products & Processes Section of this issue.

Paints, Lacquers and Varnish

¶Seasonal Revival in Both Raw Materials and Retail Trade—Interest Centers in October Convention—Zinc Oxide Slashed—

The usual seasonal downward movement in paint sales did not change but the total for the month was much higher than for any July in the past 3 years. Preliminary estimates indicate a slight improvement in retail sales in August and a sharp rise in September. Outlook for the balance of the year is particularly bright.



Trend in paint, varnish and lacquer sales.

Zinc Oxides Suddenly Reduced

Under the stress of increasingly severe competition from titanium pigments, aggravated by Atlantic seaboard competition from importers of French process zinc oxide, plus price cuts by smaller domestic producers of American process, employing secondary metal, the larger zinc oxide manufacturers unexpectedly slashed the price list from 15 to 40% on Sept. 24. The recent advances in the metal failed to prevent the cuts which became effective Oct. 1 and run to the end of the year. Another item of interest is the fact that white seal will now be packed in bags also.

Chrome Yellow 1c Lower

Despite higher lead metal markets chrome yellow was reduced 1c last month. Competition is reported responsible for this move and the condition is described in some quarters as temporary, with the likelihood of higher prices again for the 1st quarter of '36. Lead pigments were again quoted at higher prices. Casein is moving into higher ground with the call better and stocks much lower. Argentine material is again reaching this country in quantity.

Importers of wood flour lowered quotations by $2-$2.50 a ton ex dock, and are asking $20 for 40-70 mesh; $25 for 80-100; and $31 for 120 mesh.

Charcoal Higher

Softwood charcoal is higher by $2.40 a ton at eastern points, and is quoted at $25.40 delivered car lots in N. J., Delaware, Maryland, N. Y., Kentucky, Virginia, West Virginia, Tennessee, North and South Carolina, Alabama and Mississippi; $24.80 in Pennsylvania, Ohio and Michigan; $25.80 in Maine, New Hampshire, Massachusetts, Vermont, Rhode Island and Connecticut. Car lot prices in Illinois, Indiana and Minnesota are unchanged at $23 and all Western prices were unchanged. The l. c. l. price at the works is up $2 to $18 a ton.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Antimony, white pigment	$ 0.10½	$ 0.09½
Cadmium sulfide, yellow	.90	.85
Casein, 20-30	.11½	.11
80-100	.12	.11½
Argentine	.13½	.13
Charcoal, softwood	25.40	23.00
Lead, red 95%	.07	.0685
97%	.07¼	.0710
98%	.07½	.0735
Litharge	.06	.0585
Orange mineral	.10	.09¾

DECLINED

	Sept. 30	Aug. 31
Chrome yellow	$ 0.13	$ 0.14
Cochineal, gray	.32	.34
Teneriffe	.33	.35
Wood flour, imp.	20.00	22.00
Zinc oxide, American process:		
Lead free	.05	.05¾
5-25%	.04⅞	.05½
35%	.04⅞	.05¼
French process:		
Red seal	.05½	.08⅜
Green seal	.06	.09⅜
White seal	.06½	.10⅝

DEPT. OF LABOR STATISTICS

	Aug.'35	July '35	Aug.'34
Employment *a*	105.4	108.6	99.1
Payrolls *a*	87.3	88.9	77.9
Prices *b*	78.6	79.1	79.9

	Aug. '35	July '35
Exports	$1,286,000	$1,302,000

a 1923-25=100.0; *b* 1926=100.0.

September Pick-up in Volume

Paint manufacturers were taking in raw materials in larger quantities in September, preparing for the usual fall pick-up. Production schedules in practically all cases will be increased substantially over the fall period of last year.

Larger Construction Totals

August construction reached a new high level for '35. Contract total exceeded in addition, totals reported for each month since October, '31 with the exception of December, '33, January and March of '34. F. W. Dodge Corp.'s records indicate an August contract total for all types of construction in the 37 eastern states amounting to $168,557,200. During July volume reported totaled $159,257,500 while in August '34 only $119,591,800 in contracts were reported.

August construction records showed residential building contracts of $40,528,300, non-residential building awards of $58,488,500 and contracts for heavy engineering projects in the amount of $69,540,400. For residential building total was about 16% smaller than was reported for July, but a gain in excess of 100% was registered when compared with the total of only $18,634,000 for August, '34. For the 1st 8 months of '35 residential contracts awarded in the 37 eastern states

totaled $297,096,700 as compared with only $170,226,500 for the corresponding period of last year. Non-residential building contracts as well as awards for heavy engineering projects during August exceeded the levels reported for either the previous month or August '34.

Paint Industry's Share

Supported by voluminous facts and figures Theodore E. Damm, representing N. P. V. & L. A. in the Federal Housing Administration, concludes that the paint industry is profiting from better housing efforts but "hasn't even begun to save the surface." Expert Damm estimates pent-up demand as a direct result of the depression at well over a billion dollars. Other startling figures supplied: But 15 to 20% of the paintable surfaces are now property protected; industry could double its annual volume and still not realize on 50% of its opportunities.

Constructively criticizing, Mr. Damm suggests members of the paint industry are too interested in throwing out their competitors' line; know very little about selling Mr. John Q. Citizen on the advantages of time payments as applied to repairs, improvement and protection of the home.

Convention Plans

Program Committee for the annual convention of the N. P. V. & L. A., to be held in Washington, Oct. 30-31-Nov. 1, at the Mayflower, met with President Ernest T. Trigg and members of the Association staff at Association headquarters in Washington, Sept. 10, and laid plans for business sessions which will be of high interest and profit to the members of the industry. Meeting closely followed that of the Entertainment Committee for the convention, which met Sept. 5, and made initial plans for the social side of the big event. Reservations are piling up for the convention.

"Consistent Cooperation Conquers" is the slogan officially adopted by the National Program Committee for the annual convention. In promoting the spirit of this slogan, President Ernest T. Trigg has extended a cordial invitation to non-members as well as to members of the Association to be present.

Trigg in New York

Ernest Trigg, N. P. V. & L. A. president, speaking before the N. Y. City P. V. & L. A. at the New Yorker on Sept. 18th, stressed cooperation with the national organization. Pointing to tremendous markets being opened up by governmental expenditure, Mr. Trigg stated that the national organization has and will continue to oppose standardization by legislation of formulae for mixed paints of all producers. Among new developments, President Trigg cited the discovery and possible development of new chinawood oil substitute in Indo China. Dr. Gardiner, pioneer of South America's oticica oil, may be placed in charge of investigations to develop this new product. Development of soft lumbang oil in the Philippines is held up as U. S. will not guarantee fixed wages to native pickers. In the South, President Trigg believes tung oil production to be progressing slowly but satisfactorily.

For Insulating Material Makers

A new division within the N. P. V. & L. A. is being formed to consider problems of insulating material manufacturers. C. Homer Flynn of the Washington headquarters will supply detailed information.

Du Pont Wins Injunction

Du Pont reports issuance of a permanent injunction against a Los Angeles auto finisher who represented himself as a "Duco" finisher while using other than Duco material.

Guests at Krebs' Plant

Members of the Boston, Philadelphia and Baltimore paint production clubs were the guests of Krebs Pigment & Color at Wilmington over the weekend of Sept. 14. Several weeks ago the members of the N. Y. Production Club were similarly entertained and escorted through the new plant.

We All Would Like to Know

Frederick G. Jeffrey, Sargent-Gerke Paint production head, gives timely talk on "Why Paint Peels," before Indianapolis Real Estate Board.

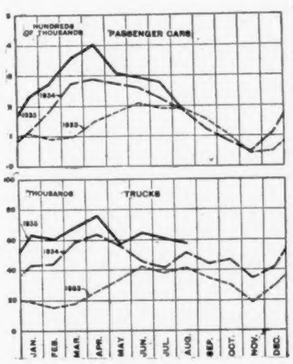
Strassel-Gans Seeks Approval

Strassel-Gans Paint, Louisville, Ky., obtains permission from Federal Judge Elwood Hamilton to reorganize assets in accordance with new legislation.

Coal Tar Chemicals

¶Coal Tar Chemicals Pass Thru a Quiet Period—Prices Firm and Unchanged—August Coke Figures Higher—

August factory sales of automobiles manufactured in the U. S. (including foreign assemblies from parts made in the U. S. and reported as complete units or vehicles), consisted of 240,051 vehicles, of which 182,389 were passenger cars, and 57,662 were trucks, as compared with 337,044 vehicles in July, 234,811 vehicles in August, 1934, and 232,855 vehicles in August, 1933. September estimates are about 160,000 units or less. There is a possibility of a 200,000 unit month in October if all of the re-tooling is completed early.



Trend in automotive production.

Less Solvent Demand

Coal tar markets were again decidedly routine. Price changes were very few and of little importance. Benzol appears firmer, and although the automotive and tire centers were in a slack period in September, the shortage in xylol, toluol, and solvent naphtha was but slightly altered. Intermediates were in better demand. Dyestuff producers are more active.

August Coke Figures

Coke production increased substantially during August. Output of both beehive and byproduct coke amounted to 2,833,707 tons, or 91,678 tons per working day, an increase of 8.4% when compared with the July rate of 84,556 tons. Gain was a direct reflection of improved activities in the iron and steel industry, where the daily rate of pig iron output increased 15.9% during the same period.

Output of byproduct coke for the 31 days of August was 2,777,607 tons, or 89,600 tons per day. Compared with July, rate increased 8.2%. Practically all of the increase occurred at furnace plants, where the daily average of 60,190 tons was 11.4% higher than that of the preceding month. At merchant plants the rate advanced only 2.2%.

Production of beehive coke also increased during the month, the average daily production of 2,078 tons being 17.5% above that of July.

Stocks at byproduct plants were 6.6% higher at the end of August than at the beginning of the month. Merchant plants increased their stock piles by 11.0%, while at furnace plants the reserves remained practically stationary.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
None.		

DECLINED

None.

	Aug. '35	July '35
Exports	$1,240,000	$1,044,000
Imports	1,057,000	1,081,000

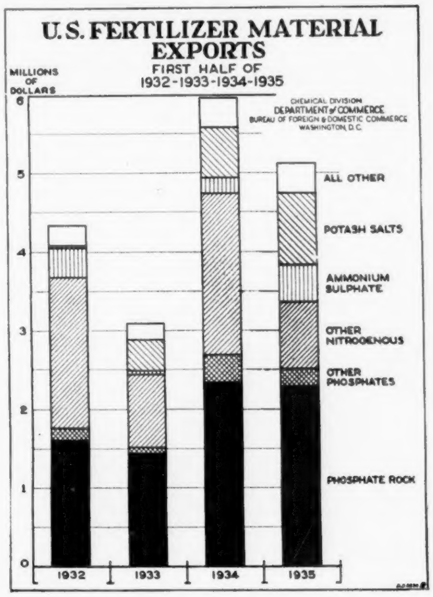
Employment and Payrolls

Chemical employment and payroll totals for the month July 15 to Aug. 15 showed increases according to Bureau of Labor Statistics. Employment stood at 81.7, an increase of 2.2 over July and 2.2 over Aug. of last year. Payroll totals were 69.7, a 7.5 increase over the '34 period and 4.4 over the previous month.

Fertilizers

¶Trading is Routine in Most Items—Last Discount on Potash Removed—N. F. A. will Meet at Atlanta—

Buying of raw fertilizer materials was done in but very modest proportions last month. Mixers are showing but mild interest in most items, but a flurry of orders were placed for potash near the close of the month as the last of the discounts were withdrawn. Some forward buying is looked for at and following the Atlanta convention. Fertilizer producers are now more concerned with the possibilities of a modified NRA, and until the situation clarifies somewhat, they are likely to place only minimum forward orders.



August Fertilizer Sales

August fertilizer sales, as represented by fertilizer tax tag sales, amounted to 44,475 tons in the 12 reporting Southern States, according to reports by State officials to The N. F. A. This was 7% less than in August of last year. In the last 4 years August sales in the South averaged only 1% of the year's total. Sales in the South for the 1st 8 months amounted to 3,504,039 tons, representing a gain of 12% when compared with the same period last year. Increases over the January-August period of last year were reported in all of the States except Florida, Arkansas, and Tennessee.

August sales in the 5 reporting Midwestern States, amounting to 63,937 tons, were 15% above August, '34, and were 82% higher than the August sales for the 5-year average of '30-'34. In the last 4 years August tag sales in the Midwest accounted, on the average, for 13% of the year's total. Midwest sales in the January-August period of this year totaled 255,500 tons, 20% more than in the same period of '34, and 83% greater than in the January-August period of '33. Each of the 5 Midwestern States have shown a substantial increase this year over last.

Important Price Changes

ADVANCED	Sept. 30	Aug. 31
Blood, dried, N. Y.	$ 2.75	$ 2.60
Chicago	3.00	2.75
Imported	2.90	2.85
Fish scrap, Balt.	2.30	2.25
Acid	2.35	2.50
Calif. sardine	34.00	nom.
Jap. sardine	36.00	nom.
Nitrogenous mat., imp.	2.35	2.30
DECLINED		
Bone meal, imp. 1 & 65	$23.00	$24.50
Nitrogenous material, East	2.20	2.25
West	1.90	2.00
Dicalcium phosphate, mat.	.70	.72

DEPT. OF LABOR STATISTICS

	Aug.'35	July '35	Aug.'34
Fert. Mat. prices b	66.8	65.7	64.8
Mixed Fert. prices b	68.1	68.6	73.0

	Aug. '35	July '35
Fertlizers & Materials:		
Exports	$1,580,000	$1,173,000
Imports	706,000	873,000

b 1926=100.0.

Seasonal Upturns in Superphosphate

Seasonal upturn in superphosphate production which began in July continued in August, with the July to August rise amounting to 16%. Output was nearly 50% larger than in August of last year but was well under the figure for the same month of '33, according to reports by acidulators to N. F. A. Production in the 1st 8 months has been larger than in any corresponding period since '30, exceeding the Jan.-Aug. period of last year by 5%.

Shipments were in a seasonal slump in August as the fall pickup does not occur until September. Consequently the statistics for last month do not possess any particular significance. Stocks increased seasonally in August, as production does not fall as low in the June-Aug. period as do shipments. As compared with the end of August, '34, stocks were 12% larger.

Pacific Island Phosphate

Phosphate Exports From Nauru and Ocean Island during the year ended June 30, 1935, totaled 695,882 long tons, as compared with 556,589 tons in the preceding year and 680,250 tons in 1932-33. Markets served in 1934-35 were: Australia, 422,761 tons; New Zealand, 214,-621; Japan, 45,600 and other countries, 12,800 tons.

A Useful Chart

N. F. A. has just completed a very comprehensive chart showing a summary of the fertilizer control laws. A limited number of copies are available.

Buys Washington Fertilizer

Smith-Douglas Co., Norfolk, N. C., buys interest in Washington Fertilizer, Washington, N. C., from Charles A. Flynn. Paul R. Waters of Washington Fertilizer will take charge of increased operations.

Chemical Specialties

¶N. Y. City Hearings on Disinfectant Specifications — New Products—Company "Doings"—Advertising Programs—

N. Y. City Dept. of Purchase tentative specification 5-D-2a, "Disinfectant, Deodorant, and Germicide (Sodium Hypochlorite Type)," was revised at hearing in the Central Testing laboratories attended by representatives from Hypozone, Cortes Ward, and the City of N. Y. Attempting to prevent open sale of disinfectants fortified with liquid chlorine which raises alkalinity and thus lowers disinfectant efficiency, the specifications prescribe definite available chlorine content at time of delivery and 6 months following delivery. Not more than .5% free alkaline content is allowed. Though sales may be made on these specifications, John H. Wright, National Association of Insecticide & Disinfectant Manufacturers secretary, urges postponement of adoption till the semi-annual meeting of the National Association of Disinfectant & Insecticide Manufacturers in N. Y. City on Dec. 10.

September Introductions

Birk Mfg. Co., New Albany, Ind., is marketing "Betty Lee's Shoe Creams" in a newly designed container. Bottle is by Owens-Illinois, and the closure by Closure Service.

Paintex is a new product which forms a bright protective coating over brass, bronze, steel, aluminum, etc. Garfield Mfg., Garfield, N. J., is the maker.

Flash Miracle, an aluminum cleanser, is made by National Chemical, 580 Market st., San Francisco.

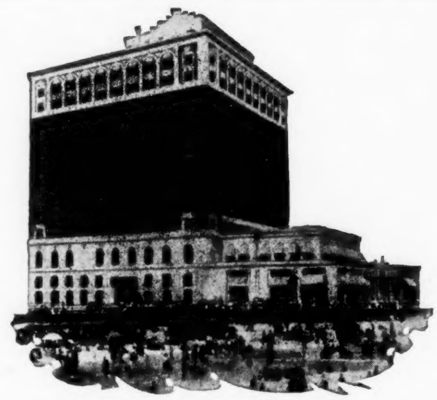
Miracle Polish is a single element polish for silver and precious metals. A. A. Pen Service and Miracle Polish Laboratory, 357 Minnesota st., St. Paul.

Other new products being introduced include "Pert Cleaning Fluid" by Enoz Chemical of Chicago; "Tick Rubless Wax" and "Tick Flushing Powder" by Derris, Inc., N. Y. City.

G. L. Lanier, 787 E. College st., Decatur, Ga., makes new shoe polish, "Lily White," retailing at 25c per 4 oz. bottle.

Fall Advertising Plans

P. & G. announces a new Camay soap contest. Last year P. & G. pushed a hundred word essay contest with a $1,000 life annuity as the main prize. This year the sponsor is back in the



field with offers of $1,000, $500 and $100 respectively, for the 3 best slogans of 10 words or less descriptive of Camay quality. They also offer 1,210 additional cash prizes ranging in value from $100 to $2.

Colgate-Palmolive-Peet issues new bi-weekly publication, *The Profit Maker*, containing helpful suggestions for retail merchants, copies obtainable by writing Jersey City offices.

Fels & Co., soap producer, through newspaper comic strip, offers sports handkerchiefs for every 5 Fels-Naphtha soap wrappers.

Standard Oil of Indiana is distributing literature on its insecticides, "Verdol" and "Superla," and its cattle spray, "Bovinol."

After having sold Lava soap for years primarily to industrial and farm workers, P. & G. is widening its promotion of this product (Blackman Advertising, Inc.)

With the Specialty Companies

Newberry Lumber & Chemical, Escanaba, Mich., makes small cast iron paper weights, ideal for use as favors, etc.

Property owners close to the proposed addition to the Memphis plant of Plough, Inc., seek to prevent its erection.

Stone Chemical Exterminating moves to 1327 S. Michigan ave., Chicago, where new line of sanitary supplies will be introduced.

Century Automobile Laboratories, Inc., Rockford, Ill., begins production of chemical products for automotive industries.

In New Locations

Twi-Laq Chemical, cleanser, wood filler and specialties producer, moves from 338 Flushing ave., to 25-29 N. Portland ave., Brooklyn, N. Y. Dr. C. F. Mason, consulting chemist, is now vice-president.

Soap & Chemical Inc., Pittsburgh, is now at 319 Federal st., and will act as a distributer for Paper Makers Chemical, and also for U. S. I. on anti-freeze.

Southport Chemical moves from 261 Greenwich st., N. Y. City, to Garwood, N. J., with offices and factory in former Pittsburgh Steel Drum's South ave. plant.

Oils and Fats

¶*Several Industries Alarmed Over Rise in Tung Oil—Oil Markets Generally are Higher—*

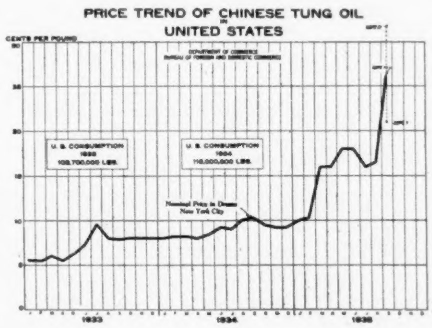
Advance in tung oil since the beginning of the year, and particularly in recent months, has resulted in much heavier imports of substitute paint and varnish oils, and manufacturers are now giving serious attention to the possibility of using more low cost synthetic resins in order to further reduce the consumption of tung oil. Annual consumption in this country

Large Shipment of Domestic Tung Oil. The O'Brien Varnish Co., South Bend, Ind., recently received from the Great Southern Lumber Co., Bogalosa, La., a freight car full of drums containing 2700 gals. of tung oil produced from nuts grown in Mississippi and Louisiana. This is said to be the largest shipment of oil extracted in the south.

of tung oil has averaged over 100 million lbs. during the past 2 years or about three-fourths of the total world production, according to C. C. Concannon of the Chemical Division, Bureau of Foreign & Domestic Commerce.

Since the beginning of '35 the nominal domestic price of tung oil delivered in drums at N. Y. City has advanced from 10c to better than 30c in September. It is evident that this 200% price increase has not been entirely due to shortage of supplies in China since exports from Hankow, the port which handles 90% of China's tung oil exports, amounted to 89,670,000 lbs. during the 1st 7 months of the current year compared with only 59,727,000 lbs. during the corresponding period of last year.

Department of Commerce statistics show that the U. S. imported a total of 80,214,600 lbs. invoiced at $8,169,300 during the 1st 8 months of the year compared



with 64,005,300 lbs. valued at $3,696,400 during the corresponding months of '34.

Turning of the paint and varnish industry to tung oil substitutes is evidenced by the heavy increase in imports of oticica, perilla, rapeseed and soybean oils, and seeds from which paint and varnish oils can be produced. This trend has been more pronounced in recent months, statistics reveal.

Imports of perilla in August totalled 6,828,100 lbs., valued at almost $432,000, compared with only 278,000 lbs. valued at $21,700, for August last year. Imports of this oil during the first 8 months of the year amounted to 55,642,000 lbs. valued at $3,394,200 against only 23,932,100 lbs. valued at $1,520,700 for the corresponding period of '34.

Imports of rapeseed oil during the 1st 8 months of this year totalled 1,762,330 gals. valued at $637,580, compared with only 76,000 gals. valued at $30,400.

Will Confer on Conditions

A conference on the production of tung oil with C. C. Concannon, chief of the chemical division, Bureau of Foreign & Domestic Commerce, and other authorities on the subject, has been scheduled for October in Beaumont, Texas.

Now Faure & Co.

Faure, Blattman & Co., one of the most famous oil houses of England and known the world over, is dissolved, and is succeeded by H. M. F. Faure & Co.

New Soy Bean Mill

The Old Fort Mills, Inc. new Marion Ohio, soy bean process plant, plans to process 1,500 to 1,600 bu. per day.

Shellac, Waxes

Weakness in domestic shellac markets disappeared last month when buyers came into the market for substantial

Important Price Changes

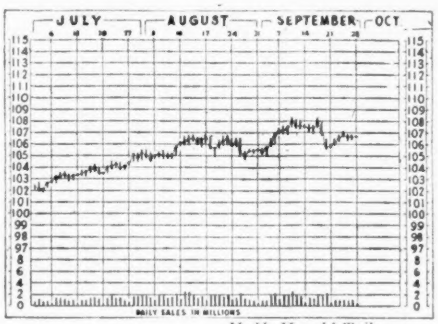
ADVANCED	Sept. 30	Aug. 31
Dammar:		
Singapore, No. 2	.12 7/8	.12 1/2
DECLINED		
Aloe, Cape	$0.13	$0.15
Curacao	.18	.19
Copal, East India, black	.06 1/2	.07 1/8
Bold scraped	.05 1/4	.05 5/8
Dammar, Batavia	.16 1/8	.17
Gambage, powd.	.62	.65
Sandarac	.26 1/4	.28 1/8
	Aug. '35	July '35
Exports, Naval Stores, gums and resins	$1,740,000	$1,259,000

quantities. As a result the various grades were up one to 2c over last month's closing prices.

Chemical Finances

¶Prices Again Show a Net Gain Despite a Relapse Early in the Month — Several Chemical Companies' Common Stocks Register Sharp Gains—Davison Chemical Announces Reorganization Plan—Air Reduction Declares a $1.50 Extra — Company Statements Encouraging—

Stock market made a net gain in September but prices generally closed the month at substantially lower levels than those reached earlier in the month. Decline was attributed directly to the fear of immediate hostilities in Africa. When it appeared that some basis of peaceful agreement might yet be made the list recovered much of the lost ground.



—N. Y. Herald-Tribune

Chemical stocks again registered advances. Outstanding gains were made in du Pont (10¾), Monsanto (10⅞), Allied (9), and Air Reduction (7½). Net losses for the month were registered in Commercial Solvents (½), Standard of N. J. (2½), and Texas Gulf Sulphur (3½).

After a month or 2 of relative quiet trading in the chemical group the general public evinced greater interest and purchasing was in much heavier volume.

Mathieson Alkali joined the upswing in chemicals, selling within a fraction of the year's high at one period during the month. Company's business turned up sharply in July and continued its gains in August, suggesting a satisfactory third quarter.

American Cyanamid on the Curb, according to Wall St. gossip of the *Wall St. Journal,* has been coming in for some attention from investment houses on the ground that it is the only chemical company that has not yet recovered normal earning power, due to the plant rehabilitation program that has been going on over the last few years. A larger gain in future earnings is therefore expected in some quarters than can be shown by other companies in the industry that have already fully recovered their normal stride.

Another factor in the renewed interest on the chemical group was the generally improved conditions in most of the chemical consuming industries.

Industry On Sound Basis

Highly encouraging are the shipments in the chemical field and the outlook for continuance of this condition through the balance of the present year. Prices, too, are generally stable. The one outstanding and rather unexpected decline was the sharp reduction in zinc oxides made last month. At the moment the prospects of a late and a relatively quiet contract season are bright.

Davison Reorganization Plan

Davison Chemical reorganization plan contemplates loan of $1,600,000 at 6% for 5 years from a group of banks. This loan will be secured by the pledge of stocks of subsidiaries of the new company. With an authorized capital of 1,000,000 shares of common, of which it is contemplated 511,500 shares will be issued in exchange for securities of the old company and its subsidiaries, a new company will be formed.

Under proposed offers, holders of notes of Davison Realty, a subsidiary, will receive about 75 shares of common in the new company for each $1,000 note including accrued interest to Dec. 18, '34. Holders of Davison Chemical notes are offered 56¾ shares of common in the new company for each $1,000 note including accrued interest to Dec. 18, '34.

Holders of bank loans, and miscellaneous creditors will receive common on substantially the same basis as is being offered to holders of Davison Chemical

Price Trend of Chemical Company Stocks

	Aug. 31	Sept. 6	Sept. 13	Sept. 20	Sept. 27	Sept. 30	Net gain or loss last month	Price on Sept. 29, 1934	1935 High	1935 Low
Air Reduction	141½	142½	147½	147½	150	149	+ 7½	101¼	152¼*	104⅜
Allied Chemical	161**	163	170	165	170	170	+ 9	126	173*	125
Columbian Carbon	87‡	88¾	92	88	88⅝	89	+ 2	67½	94	67
Com. Solvents	19	20	20⅝	18⅝	18⅞	18¾	— ¼	20⅜	23⅞	17⅝
Du Pont	118	121½	124¾	127¼	127⅞	128¾	+10¾	90⅞	135¼*	86⅝
Hercules Powder	83½§	83	84	86½	86¼	86¼	+ 2¾	.....	88⅜*	71
Mathieson	29½	30½	31¼	31	31¾	31	+ 1½	26⅜	33¾*	23¾
Monsanto	72	73¼	76½	79⅜	81⅞	82⅞	+10⅞	53⅞	84*	55
Std. of N. J.	45½	45½	44	42¾	43¼	43	— 2½	43½	50½	35¾
Texas Gulf S.	34¾	34¾	35	33⅛	31	31¼	— 3½	36½	36¾	28¾
Union Carbide	64⅝	65⅜	68¾	65	67	67⅜	+ 2¾	.....	69¾*	44
U. S. I.	42½	44⅞	47	44	45	45	+ 2½	36	48⅛*	35⅛

* New highs in Sept.; ‡ On Aug. 28; ** On Aug. 30; § On Aug. 29.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Laboratories	50c	Sept. 18	Oct. 1
Air Reduction, E.	$1.50	Sept. 30	Oct. 15
Air Reduction, Q.	75c	Sept. 30	Oct. 15
Allied Chem. & Dye	$1.50	Oct. 11	Nov. 1
Allied Chem. & Dye, pf.	$1.75	Sept. 11	Oct. 1
Aluminum Co. of Am., pf., Q	37½c	Sept. 14	Oct. 1
Aluminum Co. of Am., pf.	25c	Sept. 14	Oct. 1
Amer. Ag. Chem.	75c	Sept. 14	Sept. 30
Amer. Cyanamid, A. & B.	10c	Sept. 14	Oct. 1
Amer. Maize Prod.	25c	Sept. 23	Sept. 30
Amer. Maize Prod., pf.	$1.75	Sept. 23	Sept. 30
California Ink	50c	Sept. 21	Oct. 1
Canad. Celanese, 7% pf.	$1.75	Sept. 18	Sept. 30
Celanese Corp. of Am., 7% pf.	$1.75	Sept. 18	Oct. 1
Chickasha Cotton Oil, Sp.	50c	Sept. 9	Oct. 1
Clorox Chem., Q.	50c	Sept. 20	Oct. 1
Clorox Chem., E.	12½c	Sept. 20	Oct. 1
Colgate-Palmolive-Peet, pf.	$1.50	Sept. 5	Oct. 1
Cons. Chem. Industries, pf. A	37½c	Oct. 15	Oct. 31
Cont. Diam'd Fibre	25c	Sept. 16	Sept. 30
Devoe & Raynolds, A	25c	Sept. 19	Oct. 1
Devoe & Raynolds, A, E	25c	Sept. 19	Oct. 1
Devoe & Raynolds, B	25c	Sept. 19	Oct. 1
Devoe & Raynolds, B, E	25c	Sept. 19	Oct. 1
Devoe & Raynolds, 1st pf.	$1.75	Sept. 19	Oct. 1
Devoe & Raynolds, 2nd pf.	$1.75	Sept. 19	Oct. 1
Du Pont, deb.	$1.50	Oct. 10	Oct. 25
Eastman Kodak, E	25c	Sept. 5	Oct. 1
Eastman Kodak, Q	$1.25	Sept. 5	Oct. 1
Eastman Kodak, pf.	$1.50	Sept. 5	Oct. 1
Firestone, T. & R.	10c	Oct. 4	Oct. 21
Freeport Texas, pf.	$1.50	Oct. 15	Nov. 1
General Print. Ink	40c	Sept. 18	Oct. 1
General Print. Ink, pf.	$1.50	Sept. 18	Oct. 1
Glidden Co.	25c	Sept. 17	Oct. 1
Glidden Co., E	15c	Sept. 17	Oct. 1
Glidden Co., pf.	$1.75	Sept. 17	Oct. 1
Gold Dust	30c	Oct. 10	Nov. 1
Gold Dust, pf.	$1.50	Sept. 17	Sept. 30
Goodyear, T. & R., 7% pf.	$1.00	Sept. 1	Oct. 1
Grand Rapids Varn.	12½c	Sept. 20	Sept. 30
Great West. Elec.-Chem., new pf.	30c	Sept. 20	Oct. 1
Hazel-Atlas Glass	$1.25	Sept. 18	Oct. 1
Hercules Powd., pf.	$1.75	Nov. 4	Nov. 15
Imperial Chem. Ind. (A. D. R.)	2½%	Sept. 13	Nov. 9
Indus. Rayon	42c	Sept. 16	Oct. 1
Int'l Nickel, pf.	$1.75	Oct. 2	Nov. 1
Int'l Nickel of Can.	20c	Aug. 31	Sept. 30
Int'l Print. Ink	35c	Oct. 14	Nov. 1
Int'l Print. Ink, pf.	$1.50	Oct. 14	Nov. 1
Int'l Salt	37½c	Sept. 15	Oct. 1
Johns-Manville	25c	Sept. 24	Oct. 15
Johns-Manville, pf.	$1.75	Sept. 17	Oct. 1
Koppers Gas & Coke, pf.	$1.50	Sept. 12	Oct. 1
Liquid Carbonic	25c	Oct. 17	Nov. 1
Mathieson	37½c	Sept. 9	Oct. 1
Mathieson, pf.	$1.75	Sept. 9	Oct. 1
Merck	10c	Sept. 24	Oct. 1
Merck, pf.	$2.00	Sept. 24	Oct. 1
Monroe Chem.	25c	Sept. 14	Oct. 1
Monroe Chem., pf.	87½c	Sept. 14	Oct. 1
Nat. Lead	$1.25	Sept. 13	Sept. 30
Nat. Lead, Cl. B, pf.	$1.50	Oct. 18	Nov. 11
N. J. Zinc	50c	Oct. 21	Nov. 9
N. Am. Rayon, pr. pf.	75c	Sept. 23	Oct. 1
Paraffine Comp's.	50c	Sept. 17	Sept. 27
Penn. Salt	75c	Sept. 30	Oct. 15
Petroleum Corp. of Am.	33c	Oct. 11	Oct. 31
Pitts. Plate Glass	50c	Sept. 10	Oct. 1
Rainier Pulp & Paper, Cl. A	$1.50	Oct. 10	Oct. 15
Reynolds Metals, 5½% pf.	$1.37½	Sept. 16	Oct. 1
Sher.-Williams of Can., pf.	$1.75	Sept. 15	Oct. 1
Stan. Wholesale Ph. & Acid	30c	Sept. 18	Oct. 15
Un. Dyewood, pf.	$1.75	Sept. 13	Oct. 1
U. S. I.	50c	Sept. 16	Oct. 1
U. S. Smelt. & Rfg.	$2.00	Oct. 3	Oct. 15
Vulcan Detinning, pf.	$1.75	Oct. 10	Oct. 19
Westvaco, pf.	$1.75	Sept. 16	Oct. 1
W. Va. Pulp & Paper	10c	Sept. 17	Oct. 1

notes. Each share of Davison Chemical common will receive a stock purchase warrant for one-fifth share of the new common.

Too Low a Return

There is considerably less investment buying of high-grade chemical shares, reports the *Wall St. Journal*, now that yields on leading stocks in this group are less than 4% at current prices. These shares advanced before the general market rise got under way and investors are now apparently awaiting some indication of more generous dividend returns.

Amer. Smelt. will Redeem

American Smelting & Refining will redeem all of its outstanding 5% 1st mortgage bonds aggregating $36,383,300. To provide necessary funds new issue of 1st mortgage and 1st lien 4% bonds aggregating $25,000,000 will be sold privately to a group of 5 insurance companies.

Air Reduction Declares Extra

Air Reduction declares an extra dividend of $1.50 in addition to the regular quarterly of 75c. Three months ago a $1 extra distribution was made.

Rumors of Redemption of V.-C.'s 7%

V.-C. directors are understood to have decided to call for redemption 30% of the outstanding 7% prior preference stock. Technical details of accomplishing this have not been yet worked out, but it is expected that arrangements will be completed by the end of the year.

There are 54,572 shares of V.-C. 7% preferred stock outstanding at this time. There are $18.25 a share dividend accumulations on the stock as of Sept. 1. Stock hit a new high last month.

Company Reports

Report of International Agricultural Chemical and subsidiaries for the fiscal year ended June 30, certified by independent auditors, shows net profit of $269,388 after interest, depreciations, depletion and federal taxes. This includes (1) $40,056 as company's proportion of surplus over dividends earned by unconsolidated affiliates and (2) $19,870 profit on purchase of company's own bonds. Above net profit is equal to $2.69 a share on 100,000 shares of 7% cumulative prior preference stock (par $100), on which accrued unpaid dividends aggregated $5,250,000 or $52.50 per share at June 1, '35.

This compares with net profit of $400,-386 or $4 a share on prior preference stock in preceding year.

Severe Competition

Severe competition took place in fertilizer during the selling season, President Watson reported.

"The phosphate rock department continued to be affected by foreign governmental restrictions on imports. In spite of this we shipped our normal foreign tonnage. Recently there has been some change in these restrictions, and, with a continuance of the improved demand from our foreign buyers, our export business should show an increase.

"Domestic shipments of rock showed a falling off in tonnage because of large inventories carried over by the American fertilizer manufacturers. However, better prices, both at home and abroad, enabled us to show a net improvement over the previous year. Present indications are that both export and domestic shipments will show a substantial increase during the coming year.

"Consumption of fertilizer for the country showed an increase during the year, but the season was one of great trial because, while many were working under the NIRA and felt obligated to conform to the terms and conditions of the fertilizer code, others in the industry felt that the act was collapsing and disregarded such terms and conditions. This brought about severe competition during the spring selling season with the result that those companies which adhered to the terms and conditions of the fertilizer code operated under a handicap which adversely affected tonnage as well as prices. We, together with others, suffered because of these conditions."

Earnings Statements Summarized

Company:	Annual divi-dends	Net income 1935	Net income 1934	Common share earnings 1935	Common share earnings 1934	Surplus after dividends 1935	Surplus after dividends 1934
Archer-Daniels-Midland: Year, June 30	§$1.00	$2,525,745	$2,317,489	$4.20	$3.81	......	......
International Agricultural: Year, June 30	*f*....	269,388	400,386	*p*2.69	*p*4.00	......	......
Kennecott Copper: Six months, June 30	*w* .15	3,418,097	3,888,409	.32	.36	......	......
Leslie-California Salt: Year, June 30	§1.40	202,296	245,504	1.74	2.10	......	......
Triplex Safety Glass: Year, June 30	....	£86,503	£75,170	....	....	......	......
United Dyewood: Six months, June 30	*f*....	148,082	111,722	.29	.01	$41,000	$1,276
United Milk Products: Six months, June 30	*f*....	87,703	......	.38	....	......	......
U. S. Smelting, Ref. & Mining: Eight months, August 31	*w*2.00	4,173,521	4,148,484	5.82	5.78	......	......
Vanadium-Alloys Steel: Year, June 30	*w* .25	357,377	293,279	1.77	1.45	......	......

§ Plus extras; *f* No common dividend; *p* On preferred stocks; *w* Last dividend declared; period not announced by company.

Ducktown Chemical & Iron

Ducktown Chemical & Iron reports for '34 a net income after expenses, depreciation, interest and other charges, $4,004, equal to 57c a share on 7,030 combined preferred shares, contrasted with net loss of $236,010 in '33.

Archer-Daniels Earnings Higher

Archer-Daniels-Midland reports for the year ended June 30 a consolidated net profit of $2,525,745 after depreciation, Federal taxes and other charges. This is equivalent, after dividend requirements on the preferred, to $4.20 a share on 549,546 shares of common. In the preceding fiscal year company showed a net profit, on the same basis, of $2,317,488, or $3.81 a share on the common.

United Dyewood Nets 29c a Share

United Dyewood and subsidiaries report for 6 months ended on June 30: Net profit after depreciation, taxes, minority interest and other charges, $148,082, equal, after 7% preferred dividend requirements, to 29c a share on 139,183 $10-par common, against $111,722, or 1c a common share last year. Income accounts of foreign subsidiaries have been converted at the average rates of exchange prevailing during the 6 months ended June 30, with the exception of depreciation converted at the equivalent of the U. S. dollar cost.

Plough Earnings Decline

Plough, Inc., and subsidiaries (chemical specialty producers) 6 months ended June 30: Net income after expenses, depreciation, Federal taxes and other charges, $157,413, equal to 61c a share on 257,148 shares, compared with net income before taxes of $159,953 or 75c a share on 212,722 shares in same time last year.

Penn. Salt Tops Last Year

Penn. Salt and subsidiaries report for year ended June 30 a net profit of $891,-086 after depreciation, depletion, taxes and other charges, equal to $5.94 a share on 150,000 capital shares, against $757,-236, or $5.05 a share, in preceding year.

Glidden August Sales

Glidden's August sales totaled $3,562,-492 comparing with $2,586,483 in August, '34, an increase of $976,009, or 37.7%.

Eagle-Picher Meeting Postponed

The special meeting of stockholders of Eagle-Picher Lead scheduled for Sept. 23, was postponed until Oct. 23. A committee of company officials meantime will confer with a committee of dissenting preferred stockholders in an effort to iron out differences which have delayed approval of the plan to reduce par value of the 900,000 shares of common to $10 from $20 a share. The $9,000,-000 capital surplus thus to be created would be used to eliminate the capital deficit, to set up reserves, make write-offs and to create a net capital surplus of around $1,200,000.

Chemical Stocks and Bonds

1935 September Last	1935 September High	1935 September Low	1934 High	1934 Low	1933 High	1933 Low	Sales: Number of shares Sept. 1935	Sales: Number of shares 1935	Stocks	Par $	Shares Listed	An. Rate*	Earnings $-per share-$ 1934	Earnings $-per share-$ 1933
NEW YORK STOCK EXCHANGE														
149	152¼	104⅜	113	91¾	112	47½	10,800	106,100	Air Reduction	No	841,288	$5.50	4.98	3.79
170½	173	125	160¾	115⅛	152	70¾	13,700	185,200	Allied Chem. & Dye	No	2,214,099	6.00	6.83	5.50
126	127½	122½	130	122⅛	125	115	2,300	18,500	7% cum. pf.	100	345,540	7.00	50.79	42.24
52½	57¾	41½	48	25¼	35	7¼	11,900	117,100	Amer. Agric. Chem.	100	315,701	2.00	6.37	p4.19
26⅞	33¼	22½	62½	20¾	89⅞	13	43,700	215,400	Amer. Com. Alcohol	20	260,716	None	3.57	4.56
48	52	36	39⅛	26¼	29¼	9¾	7,800	91,500	Archer-Dan-Midland	No	541,546	1.50	p4.21	p3.82
43¼	47½	32¾	55½	35¼	39⅛	9	10,500	84,300	Atlas Powder Co.	No	234,235	2.00	2.49	.74
113⅛	114	106¾	106¾	83	83⅛	60	260	5,160	6% cum. pfd.	100	88,781	6.00	13.54	8.38
28⅜	35⅜	19½	44⅞	17⅛	58⅞	4½	158,500	821,200	Celanese Corp. Amer.	No	987,800	None	1.25	3.32
17⅝	19¼	15⅛	18⅛	9½	22⅜	7	58,600	591,700	Colgate-Palm.-Peet	No	1,985,812	.75	1.16	— .57
104½	105½	101	102½	68½	88	49	800	17,300	6% pfd.	100	254,500	6.00	15.14	1.51
89	94	67	77¼	58	71½	23⅛	15,700	165,100	Columbian Carbon	No	538,154	3.40	3.93	2.17
18¾	28⅞	17⅝	36¾	15¾	57¼	9	188,700	1,061,200	Commer. Solvents	No	2,635,371	.85	.89	.88
62½	78⅜	60¼	84½	55½	90⅝	45⅜	20,100	257,000	Corn Products	25	2,530,000	3.00	3.16	3.87
149	165	149	150½	135	145¾	117½	700	7,400	7% cum. pfd.	100	243,739	7.00	39.65	46.02
37½	50⅜	35½	55¼	29	33⅞	10	2,300	21,200	Devoe & Rayn. A	No	95,000	2.00	2.36	3.82
128¾	135¼	86⅝	103⅞	80	95⅞	32⅛	79,200	726,100	DuPont de Nemours	20	10,871,997	3.15	3.63	2.93
129½	131	126⅞	128½	115	117	97½	2,500	27,800	6% cum. deb.	100	1,092,699	6.00	42.73	35.58
156¼	161	110½	116½	79	89¾	46	15,600	176,700	Eastman Kodak	No	2,250,921	4.00	6.28	4.76
158½	164	141	147	120	130	110	130	4,640	6% cum. pfd.	100	61,657	6.00	235.22	180.34
23½	28½	17¼	50⅜	21½	49⅜	16⅛	15,500	205,000	Freeport Texas	10	784,664	2.00	1.76	3.01
121	120½	112½	160⅛	113½	160⅛	97	10	1,740	6% conv. pfd.	100	25,000	6.00	120.08	156.73
37	37⅛	23⅜	28⅜	15⅝	20	3¾	52,400	323,000	Glidden Co.	No	603,304	.90	.....	1.54
107¾	110¼	104⅞	107½	83	91½	48	820	7,040	Glidden, 6% pfd.	100	63,044	7.00	.....	22.60
103½	117½	85	96⅞	74	85⅞	65	6,400	47,200	Hazel Atlas	25	434,409	5.00	5.21	6.22
86¼	88⅜	71	81⅝	59	68⅝	15	8,900	51,900	Hercules Powder	No	582,679	3.00	3.94	2.79
127½	128	122	125¾	111	110⅛	85	340	4,460	7% cum. pfd.	100	105,765	7.00	28.79	22.38
33	33⅜	23½	32	19⅜	85	24	38,000	358,400	Industrial Rayon	No	600,000	1.68	2.23	3.01
3¼	5	2⅝	6⅛	2	5⅞	⅞	18,000	117,600	Interr. Agricul.	No	436,049	None	p—.99	p .69
31	42¾	26	37¼	15	23½	5	6,500	42,300	7% cum. pr. pfd.	100	100,000	None	p2.69	p4.00
30¼	31⅝	22¼	29¼	21	23¼	6¾	222,600	1,491,500	Intern. Nickel	No	14,584,025	.60	1.14	.53
29¼	36¼	29	32	21	27¾	13¾	2,500	21,400	Intern. Salt	No	240,000	1.50	2.02	2.04
33⅞	36¼	32	33⅛	15¾	22	7½	6,200	40,300	Kellogg (Spencer)	No	500,000	1.60	.....	v3.01
39¾	39⅝	21½	43⅞	22½	37⅜	4⅜	89,300	625,600	Libbey Owens Ford	No	2,559,042	1.20	1.25	1.64
31	34⅞	24½	35⅜	16⅛	50	10¼	18,600	156,500	Liquid Carbonic	No	342,406	1.25	.....	v1.05
31	33¾	23¾	40¾	23½	46⅝	14	35,500	225,200	Mathieson Alkali	No	650,436	1.50	1.20	1.70
82⅞	84	55	61⅝	39	83	25	27,700	149,600	Monsanto Chem.	10	864,000	1.25	3.03	2.57
182⅛	185	145	170	135	140	43¼	1,300	14,900	National Lead	100	309,831	5.00	8.38	6.98
159	162½	150	146½	122	128¼	101	600	4,040	7% cum. "A" pfd	100	243,676	7.00	20.12	18.35
138¼	140½	121⅝	121½	100½	109⅛	75	330	3,440	6% cum. "B" pfd.	100	103,277	6.00	35.36	30.45
6¾	8	4⅜	13	5½	11¾	1⅜	62,100	136,300	Newport Industries	1	519,347	None	.31	.05
94	104	80	94	60	96¾	31½	27,300	133,800	Owens-Illinois Glass	25	1,200,000	4.00	5.41	4.86
52¼	53¾	42⅜	44⅜	33⅛	47½	19⅝	20,800	270,600	Procter & Gamble	No	6,410,000	1.70	p 2.23	p 2.11
116¾	120¾	115	117	102½	110¾	97	440	4,980	5% pfd. (ser. 2-1-29)	100	171,569	5.00	p88.13	p83.69
5⅛	6	4	6¾	3⅛	7¼	1⅜	16,100	99,800	Tenn. Corp.	5	857,896	None	.27	— .11
31¾	36¾	28¾	43¼	30	45¼	15¼	45,800	363,000	Texas Gulf Sulphur	No	2,540,000	2.00	1.81	2.93
67⅜	69¾	44	50⅞	35⅞	51⅞	19¾	101,000	901,200	Union Carbide & Carbon	No	9,000,743	1.60	2.28	1.59
67	68	46	50⅜	35	37¾	10¼	16,700	197,600	United Carbon	No	370,127	2.40	3.55	1.39
45	48⅛	35⅛	64¾	32	94	13½	40,000	242,400	U. S. Indus. Alco.	No	391,033	None	4.04	3.56
18½	21¾	11¼	31¾	14	36¼	7⅝	65,600	327,400	Vanadium Corp.-Amer.	No	366,637	None	—2.29	—2.40
4	4⅝	2½	5⅜	1⅞	7⅜	⅝	48,300	119,400	Virginia-Caro. Chem.	No	486,000	None	p—.79	p—2.46
27½	29¾	17½	26	10	26½	3⅜	58,200	187,700	6% cum. part. pfd.	100	213,392	None	p4.20	p .52
115	120	85	84	59¼	63½	35⅜	1,500	8,600	7% cum. prior pfd.	100	60,000	None	p23.50	p9.06
19	23½	16¾	27¼	14⅞	20½	5	8,800	68,100	Westvaco Chlorine	No	284,962	.40	1.55	1.08
NEW YORK CURB EXCHANGE														
23½	25⅛	15	22½	14⅝	16½	3¼	60,500	609,600	Amer. Cyanamid "B"	No	2,404,194	m .10	.99	.99
3	4	2	4⅛	2⅜	4½	1	400	10,600	British Celanese Am. R.	10	2,806,000	None	.....	.....
110	110	90	105¼	81	110	27	1,675	19,035	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	16.37	32.24
108¾	110½	97½	102	83	90	51	1,200	5,925	7% cum. prior pfd.	100	113,668	7.00	28.13	47.98
.....	.....	.....	19	7	26⅞	2	....	7,700	Celluloid Corp.	15	194,952	None	—1.67	—1.00
13¼	14½	11⅝	14⅜	10½	11⅝	4⅛	300	7,500	Courtaulds' Ltd.	1 £	24,000,000	7½%	7.57%	8.98%
99¾	105½	80½	91	67½	78	30	6,100	61,600	Dow Chemical	No	945,000	2.00	3.32	†3.60
9½	12½	6¼	10¾	4	8	½	18,100	71,200	Duval Texas Sulphur	No	500,000	None	.....	z .08
47½	52½	37	40¾	19	19	8	1,600	16,700	Heyden Chem. Corp.	10	147,600	1.35	3.07	2.74
79⅞	81¾	46¾	57½	39	39⅞	13	7,400	104,100	Pittsburgh Plate Glass	25	2,141,305	1.40	2.69	1.87
109	112	84	90½	47¼	47	12⅞	6,700	80,060	Sherwin Williams	25	635,583	3.00	.....	y3.54
108	113½	106	109¾	100	99	80	350	4,140	6% pfd. AA. cum.	100	155,521	6.00	.....	y20.78
PHILADELPHIA STOCK EXCHANGE														
100	105¼	76½	75	50¼	57	25¼	710	5,064	Pennsylvania Salt	50	150,000	4.00	p5.94	p5.07

1935 September Last	1935 September High	1935 September Low	1934 High	1934 Low	1933 High	1933 Low	Sales Sept. 1935	Sales 1935	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
112½	112¾	104½	106¾	83⅞	89	64	290,000	4,057,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
18¼	19¼	7⅜	17¾	5	14⅛	2⅛	209,000	1,429,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
83½	88½	77⅜	88	61½	74⅞	37	44,000	532,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
99	99¾	91⅛	92	62	65	38½	45,000	1,301,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
16⅞	19	7	19½	5⅛	14⅞	2½	1,181,000	7,885,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
68½	94	66	98½	89⅞	99⅛	87	57,000	832,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
32⅛	38	32⅛	74½	34½	62	33¾	13,000	30,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
102	102	91½	90	65½	76	50	49,000	325,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
83	94¼	66	89½	62	81	34¾	155,000	1,640,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000

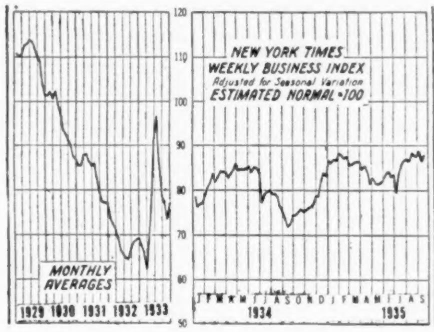
† Years ended 5-31-34 and 35; *m* Last paid, no regular rate; *p* Years ended 6-30-35 and 6-30-34; *v* Year ended 9-1-34; *y* Year ended 8-31-34; *z* Year ended 8-31-34; * Including extras.

Industrial Trends

¶*Business Continues to Recover But the Pace is Slightly Slower—Outlook for Next Six Months Bright—*

Business during September continued the steady improved pace of the past 60-90 days. Activity is now at the highest level since 1930, and the outlook for the fall and winter seasons is bright. Retail trade was spurred on by rather unseasonably cold weather in most parts of the country. A preliminary survey indicates retail trade about 9% ahead of the same period last year. With industrial employment rising and the work relief program gaining momentum, further gains are looked for in October. Wholesalers in many lines are finding difficulties in keeping shipments up to the frequent reorders.

Activity in the heavy industrial lines is encouraging also, although steel production was down somewhat in September and automotive production declined to a low for the year. Both conditions are regarded as strictly temporary with definite improvement in sight during the current month. Petroleum refinery operations, electric output, merchandise loadings and coal production all show increases. Car loadings reached a 4-year high last month and 2 weeks of better than 700,000 cars were reported. Construction reports are more favorable, residential building is showing healthy expansion and engineering contract awards are ahead of the same period of last year.



Business declined then recovered in September.

Other industries report substantial gains including the paper, glass, rubber, tanning, shoe fields. A seasonal betterment is taking place in paint, varnish and lacquer production.

The automotive industry is just loaded down with optimism as it goes about preparing for the '36 season. With the N. Y. show pushed ahead nearly 2 months from the former traditional January date the customary early winter lull in the Detroit area will be a thing of the past. The industry is again talking a 5,000,000 car year. Even the more conservative are looking for at least 4,500,000 in '36.

Recovery in textiles continues. Even cotton cloth production is being speeded up and the busy state in the silk, woolen and rayon divisions is unchanged. Situation in the latter is particularly encouraging and there is now a strong possibility that a new all-time production record will be made. Serious concern is felt in silk centers over the mounting price of raw silk. Feeling in the trade is that serious losses may be incurred to synthetic fabrics if the trend is continued much further. Generally speaking, after an extremely poor start in the 1st half of the year the textile industry is making such headway that the year's totals may prove highly surprising.

Commodity markets along with the stock market had a temporary set-back last month when realization of the acute situation in Africa and Europe became more general. After a few days of hesitancy, however, most indices show at least partial recovery.

N. Y. Times Index of Business Activity reflects the improved state of trade. Combined index on Sept. 21 stood at 87.8, as compared with 72.3 on Sept. 22, '34. It was, however, slightly under the figure of 88.2 on Aug. 24, '35, largely because of the temporary lull in steel.

Encouraging outlook for fall business was forecast by 2 different important organizations last month. In the most optimistic statement on the recovery movement it has yet made, the American Federation of Labor recently stated that business was showing greater vitality than in any upswing since 1933 and that "the last four months of 1935 may well bring the highest level of industrial operations and earnings for any similar period since 1930."

"The present business upswing," the Federation said, "is the healthiest thus far; it is the first not due to government spending or currency action; the first which seems due chiefly to inherent economic strength."

Strikingly similar was the report of the Federal Advisory Council.

Statistics of Business

	August 1935	August 1934	July 1935	July 1934	June 1935	June 1934
Automotive production	240,051	234,811	337,049	264,933	361,320	306,477
Bldg. contracts*‡	$168,557	$119,592	$159,249	$119,662	$148,005	$127,131
Failures, Dun & Bradstreet	910	929	931	912	961	1,033
Merchandise imports‡	$170,139	$119,513	$177,698	$127,229	$156,756	$136,109
Merchandise exports‡	$172,204	$171,984	$173,371	$161,572	$170,193	$170,519
Newsprint Production						
Canada, tons	235,573	216,164	234,266	208,238	232,020	229,637
U. S., tons	75,187	80,903	73,108	76,184	77,339	83,504
Newfoundland, tons	29,565	30,223	29,336	27,298	27,559	28,571
Mexico, tons	2,069	1,868	1,933	2,047	1,683	1,813
Total, tons	342,394	329,158	338,643	313,767	338,601	343,525
Plate glass prod., sq. ft.	14,526,312	7,449,906	13,908,529	7,241,867	13,162,515	6,520,081
Steel ingots production	2,914,326	1,381,350	2,270,224	1,489,453	2,230,893	3,059,483
Steel activity, % capacity	48.84	23.24	39.44	27.06	40.31	53.44
Pig iron production	1,761,286	1,054,000	1,520,263	1,224,826	1,552,514	1,930,133
U. S. consumption, crude rubber, tons	39,242	33,216	36,384	32,553	36,623	40,147
Tire shipments	......	......	5,447,109	4,157,411	4,262,360	5,228,251
Tire production	......	......	3,531,834	3,352,836	3,909,832	4,342,170
Tire inventory	......	......	8,849,503	9,436,816	10,755,400	10,219,361
Dept. of Labor Indices†						
Factory payrolls, totals†	69.7	62.2	65.3	60.5	z66.4	64.9
Factory employment†	81.7	79.5	80.4	79.5	z79.9	81.1
Chemical price index†	84.3	79.2	84.6	78.5	86.3	78.6
Chemical employment†*a*	107.7	110.9	109.0	112.3	108.1	111.7
Chemical payrolls†*a*	103.3	96.5	101.6	96.6	98.0	96.1
Chemicals and Related Products						
Exports‡	......	......	$8,372	$7,297	$7,979	$8,189
Imports‡	......	......	$3,638	$4,519	$4,575	$4,418
Stocks, mfd. goods†	......	119	......	117	118	115
Stocks, raw materials†	......	169	......	161	83	93
Cement prod., ratio of prod. to capacity	31.8	34.5	35.3	35.7	39.6	39.8
Anthracite prod., tons	2,591,000	3,584,000	z3,536,000	2,973,978	4,878,738	3,495,223
Bituminous prod., tons	25,980,000	27,452,000	z22,252,000	24,869,000	30,067,000	......
Tire rim inspections	......	......	......	......	1,428,314	1,015,730
Boot and shoe prod.	......	......	......	......	26,485,379	28,543,777

Week Ending	Carloadings 1935	Carloadings 1934	Carloadings % of Change	Electrical Output§ 1935	Electrical Output§ 1934	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices: Fats & Oils	Chem. & Drugs	Mixed Fert.	Fert. Mat.	All Groups	‡‡Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
Aug. 31	679,861	647,531	+5.0	1,809,716	1,626,881	+11.2	79.8	73.6	95.4	71.0	64.7	78.6	79.0	45.8	87.1	118.7
Sept. 7	592,786	563,883	+5.1	1,752,066	1,564,867	+12.0	81.7	74.1	95.4	71.0	64.7	78.6	79.2	49.7	88.5	118.4
Sept. 14	700,357	647,485	+8.2	1,827,513	1,633,683	+11.9	81.3	73.9	95.4	71.0	64.7	78.8	78.9	48.3	86.5	117.6
Sept. 21	707,644	644,498	+9.8	1,851,541	1,630,947	+13.5	81.2	74.2	95.4	70.8	64.7	79.3	79.2	48.9	87.8	117.4
Sept. 28	......	......	....	....	....	.....	81.4	74.2	95.4	70.8	64.7	79.0	....	....	....	116.9

* 37 states; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; ‡ 000 omitted; § K.W.H., 000 omitted; *a* Includes all allied products but not petroleum refining; ‡‡ 1926-1928 = 100.0; *z* Revised.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizers and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1934 Average $1.31 - Jan. 1935 $1.23 - Sept. 1935 $1.18

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Acetaldehyde, drs c-l, wks lb.	...	.14	...	.14	.14	.16½
Acetaldol, 95%, 50 gal drs wks ....lb.	.21	.25	.21	.25	.21	.31
Acetamide, tech, lcl, kegs..lb.	.38	.43	.38	.43	.40	1.35
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys ....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech, drs ....lb.	.22	.24	.22	.24	.22	.32
Acetone, tks, delv ....lb.	.11	.12	.11	.12	.10	.12
drs, c-l, delv ....lb.	...	.12	...	.12	.12	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68

ACIDS

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Abietic, kgs, bbls ....lb.	.06¾	.07	.06¾	.07	.06	.07
Acetic, 28%, 400 lb bbls, c-l, wks ....100 lbs.	...	2.45	2.40	2.45	2.40	2.91
glacial, bbls, c-l, wks 100 lbs.	...	8.43	8.25	8.43	8.25	10.02
glacial, USP, bbls, c-l, wks ....100 lbs.	...	12.43	12.25	12.43	...	12.25
Adipic, kgs, bbls ....lb.	...	.72	...	.72	.72	.72
Anthranilic, refd, bbls ....lb.	.85	.95	.85	.95	.85	.95
tech, bbls ....lb.	...	.75	...	.75	.65	.75
Battery, cbys, delv ..100 lbs.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb kgs ..lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs ....lb.	.54	.59	.54	.59	...	...
Boric, tech, gran, 80 tons, bgs, delv ....ton *a*	...	95.00	80.00	95.00	80.00	80.00
Broenner's, bbls ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 95%, cbys ....lb.	.53	.60	.53	.60	.53	.85
edible, c-l, wks, cbys ...lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs ....lb.	...	.22	...	.22	.22	.22
wks ....lb.	...	.23	...	.23	.23	.23
tks, wks ....lb.	...	.21	...	.21	.21	.21
Camphoric, drs ....lb.	...	5.25	...	5.25	5.25	5.25
Chicago, bbls. ....lb.	...	2.10	...	2.10	2.10	2.10
Chlorosulfonic, 1500 lb drs, wks ....lb.	.03½	.05	.03½	.05½	.04½	.05½
Chromic, 99¾%, drs, delv lb.	.14¼	.16¼	.13¾	.16¼	.13½	.15¾
Citric, USP, crys, 230 lb bbls ....lb. *b*	.28	.29	.28	.29	.28	.30
anhyd, gran, drs ....lb. *b*	...	.31	...	.31	.31	.31
Cleve's, 250 lb bbls ....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal.	.45	.47	.46	.48	.46	.47
99%, straw, LB, drs, wks, frt equal ....gal.	.64	.65	.64	.65	.64	.65
resin grade, drs, wks, frt equal ....gal.	.54	.55	.54	.55	.54	.55
Crotonic, drs ....lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs ..lb.	.11	.13	.11	.13	.11	.13
Fumaric, bbls ....lb.	...	.60	...	.60	...	...
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs. ....lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls ....lb.	.65	.68	.65	.68	.60	.70
USP, bbls ....lb.	.70	.80	.70	.80	.74	.80
Gamma, 225 lb bbls, wks...lb.	.77	.79	.77	.79	.77	.79
H, 225 lb. bbls, wks ....lb.	.50	.55	.50	.55	.50	.70
Hydriodic, USP, 10% sol. cbys ....lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks ....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks ....lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks ....lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks ....lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls ....lb.	.04½	.05	.04½	.05	.04	.05
22%, light refd, bbls ..lb.	.06½	.07	.06½	.07	.06½	.07
44%, light, 500 lb bbls ..lb.	.11½	.12	.11½	.12	.11½	.12
44%, dark, 500 lb bbls ..lb.	.09½	.10	.09½	.10	.09	.10
50%, water white, 500 lb bbls ....lb.	...	.14½	...	...	...	...
USP X, 85%, cbys ....lb.	.45	.50	.45	.50	...	...
Laurent's, 250 lb bbls ....lb.	.36	.37	.36	.37	.36	.37
Linoleic, bbls ....lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs ....lb.	.29	.32	.29	.32	.25	.32
Malic, powd, kgs ....lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks ....N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.01
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls ....lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Muriatic, 18°, 120 lb cbys, c-l, wks ....100 lb.	...	1.35	...	1.35	...	1.35
tks, wks ....100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks ..100 lb.	...	1.45	...	1.45	...	1.45
tks, wks ....100 lb.	...	1.20	...	1.20	...	1.20
22°, c-l, cbys, wks ..100 lb.	...	1.95	...	1.95	...	1.95
tks, wks ....100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys ....lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls ....lb.	.85	.87	.85	.87	.85	.87
Naphthenic, drs ....lb.	.12	.13	.12	.13	.10	.13
Naphthionic, tech, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys. c-l, wks ....100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks..100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks..100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks..100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Phosphoric, 50%, USP, cbys ....lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks..lb.	.06	.08	.06	.08	.05	.08
75%, acid, c-l, drs, wks..lb.	.09	.10½	.09	.10½	.07	.10½
Picramic, 300 lb bbls, wks.lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks ....lb.	.30	.40	.30	.40	.30	.50
Propionic, 98% wks, drs..lb.	...	.35	...	.35	...	...
80% ....lb.	.15	.17½	.15	.17½	...	...
Pyrogallic, crys, kgs, wks..lb.	1.55	1.65	1.55	1.65	1.40	1.65
Salicylic, tech, 125 lb bbls, wks ....lb.	...	.40	...	.40	.33	.40
Sebacic, tech, drs, wks ....lb.	...	.58	...	.58	...	.58
Succinc, bbls ....lb.	...	.75	...	.75	...	...
Sulfanilic, 250 lb bbls, wks lb.	.18	.19	.18	.19	.18	.19
Sulfuric, 60°, tks, wks .. ton	...	11.00	...	11.00	...	11.00
c-l, cbys, wks ....100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks ....ton	...	15.50	...	15.50	15.00	15.50
c-l, cbys, wks ....100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks ....lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ....ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls ....lb.	...	.24	.24	.25	.25	.26
Tobias, 250 lb bbls....lb.	.75	.80	.75	.80	.75	.80
Trichloroacetic bottles....lb.	2.45	2.75	2.45	2.75	2.00	2.75
kgs ....lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls ....lb.	1.50	1.60	1.50	1.60	1.35	1.70
Vanadic, drs, wks ....lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls ....lb.	.50	.60	.45	.60	.35	.53
dark, bbls ....lb.	.12	.17	.12	.17	.10	.17
egg, edible ....lb.	...	1.05	.85	1.05	.82	.92
vegetable, edible ....lb.	.65	.70	.65	.70	.65	.70

ALCOHOLS

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Alcohol, Amyl, secondary, tks, delv ....lb.	...	.108	...	.108	...	.108
c-l, drs, delv ....lb.	...	.118	...	.118	...	.118
Amyl, tertiary, tks, delv lb.	...	nom.	.052	.072	...	.052
c-l, drs, delv ....lb.	...	nom.	.062	.082	...	.062
Benzyl, bottles ....lb.	.65	1.10	.65	1.10	.75	1.10
Butyl, normal, tks, delv .lb. *d*	...	.12	...	.12	.09½	.12
c-l, drs, delv ....lb. *d*	...	.13	...	.13	.10½	.13
Butyl, secondary, tks, delv ....lb. *d*	...	.096	...	.096	.076	.096
c-l, drs, delv ....lb. *d*	...	.106	...	.106	.086	1.06
Capryl, drs, tech, wks ..lb.	...	.85	...	.85	.85	.85
Cinnamic, bottles ....lb.	3.25	3.65	3.25	3.65	3.25	3.65
Denatured, No. 5, c-l, drs, wks ....gal. *e*	...	.49*	.34	.49	.30	.34
Western schedule, c-l, wks ....gal. *e*	...	.39½	.38	.39½	...	...
Denatured, No. 1, tks, wks ....gal. *e*	...	.31	.29½	.31	.29½	.304
c-l, drs, wks ....gal. *e*	...	.36	.34½	.36	...	...
Western schedule, tks, wks ....gal. *e*	...	.35	.32½	.35	...	...
c-l, drs, wks ....gal. *e*	...	.40	.37½	.40	...	...
Diacetone, tech, tks, delv ....lb. *f*	...	.16	...	.16	...	...
c-l, drs, delv ....lb. *f*	...	.17	...	.17	...	.17

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case; * Dealers are given 20% off this price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market		1935		1934	
			Low	High	Low	High
Alcohols (continued)						
Ethyl, 190 proof, molasses,						
tks ....gal. g	...	4.10	4.08½	4.10	...	4.08½
c-l, drs ....gal. g	4.17	4.27	4.13½	4.27	...	4.13½
c-l, bbls ....gal. g	4.18	4.28	4.15½	4.28	4.12½	4.24½
absolute, drs ......gal. g	4.57½	6.11½	4.55½	6.11½	...	...
Furfuryl, tech, 500 lb,						
drs ....lb.	...	.35	...	.35	.35	.40
Hexyl, secondary tks, delv lb.	...	.11½	...	.11½	...	.11½
c-l, drs, delv ....lb.	...	.12½	...	.12½	...	.12½
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	4.00	4.50	4.00	4.50	4.00	4.50
Isobutyl, refd, lcl, drs ..lb.	...	.12	.12	.60	.60	.75
c-l, drs ....lb.	...	.11½	...	...	...	...
tks ....lb.	...	.10½	...	...	...	...
Isopropyl, refd, c-l, drs..lb.	...	.55	...	.55	.45	.55
Propyl, norm, 50 gal drs gal.	...	.75	...	.75	...	.75
Special Solvent, tks, wks gal.	...	.32	...	...	...	...
Western points, tks,						
wks ....gal.	...	.35	...	...	...	...
Aldehyde ammonia, 100 gal						
drs ....lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb						
bbls ....lb.	.60	.65	.60	.65	.65	.70
Alphanaphthylamine, 350 lb						
bbls ....lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l,						
bbls, wks ....100 lb.	...	3.00	...	3.00	2.90	3.00
25 bbls or more,						
wks ....100 lb.	...	3.15	...	3.15	...	3.15
less than 25 bbls,						
wks ....100 lb.	...	3.25	...	3.25	...	3.25
Granular, c-l, bbls, wks 100 lb.	...	2.75	...	2.75	...	2.75
25 bbls or more, wks 100 lb.	...	2.90	...	2.90	...	2.90
Powd, c-l, bbls, wks 100 lb.	...	3.15	...	3.15	...	3.15
25 bbls or more, wks 100 lb.	...	3.30	...	3.30	...	3.30
Chrome, bbls ....100 lb.	7.00	7.25	7.00	7.25	6.50	7.25
Potash, lump, c-l, bbls,						
wks ....100 lb.	...	3.25	...	3.25	...	3.25
25 bbls or more, wks 100 lb.	...	3.40	...	3.40	...	3.40
Granular, c-l, bbls, wks 100 lb.	...	3.40	...	3.00	...	3.00
25 bbls or more, bbls,						
wks ....100 lb.	...	3.00	...	3.15	...	3.15
Powd, c-l, bbls, wks 100 lb.	...	3.40	...	3.40	...	3.40
25 bbls or more, wks 100 lb.	.	3.55	...	3.55	...	3.55
Soda, bbls, wks ......100 lb.	4.00	4.15	4.00	4.15	3.50	4.15
Aluminum metal, c-l						
NY ....100 lb.	19.00	20.00	19.00	23.30	20.00	24.30
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%,						
wks ....lb.	.07	.12	.07	.12	.07	.12
93%, wks ....lb.	.05	.08	.05	.08	.04	.08
Crystals, c-l, drs, wks ...lb.	.06½	.07	.06½	.07	.06½	.01
Solution, drs, wks ....lb.	.03	.03½	.03	.03½	.03	.03½
Hydrate, 96%, light, 90 lb.						
bbls, delv ....lb.	.13	.15	.13	.15	.13	.16½
heavy, bbls, wks ....lb.	.04	.04½	.04	.04½	.04	.04½
Oleate, drs ....lb.	...	.15¼	...	.15¼	...	.15¼
Palmitate, bbls ....lb.	.21	.22	.20	.22	.19	.21
Resinate, pp., bbls ....lb.	...	.15	...	.15	.12½	.15
Stearate, 100 lb bbls....lb.	.18	.20	.17	.20	.17	.18
Sulfate, com, c-l, bgs,						
wks ....100 lb.	...	1.35	...	1.35	1.35	1.35
c-l, bbls, wks ......100 lb.	...	1.55	...	1.55	1.55	1.55
Sulfate, iron-free, c-l, bgs,						
wks ....100 lb.	...	1.90	...	1.90	1.90	1.90
c-l, bbls, wks ......100 lb.	...	2.05	...	2.05	2.05	2.05
Aminoazobenzene, 110 lb						
kgs ....lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks..lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.21½	.15¼	.21½	.15¼	.21½
26°, 800 lb drs, delv ....lb.	.02½	.03	.02½	.03	.02½	.03
Aqua 26° tks NH ....cont.	...	.05	...	.05	...	.05
tk wagon ....lb.	...	.024	...	.024	...	...
Ammonium Acetate, kgs ..lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b.						
plant ....100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls...lb.	.15	.17	.15	.17	.15	.17
carbonate, tech, 500 lb						
bbls ....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb						
bbls, wks ....100 lb	4.45	4.90	4.45	4.90	4.45	5.25
Gray, 250 lb bbls wks...lb.	5.00	5.75	5.00	5.75	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10	.11
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Linoleate ....lb.	.11	.12	.11	.12	.11	.12
Nitrate, tech, cks ....lb.	.04	.05	.04	.05	.03¼	.05
Oleate, drs ....lb.	...	.10	...	.10	...	.10
Oxalate, neut, cryst, powd,						
bbls ....lb.	.26	.27	.26	.27	.26	.27
pure, cryst, bbls, kgs..lb.	.27	.28	.27	.28	.27	.28
Serchlorate, kgs ....lb.	...	.16	...	.16	.16	.16
Persulfate, 112 lb kgs ..lb.	.22½	.25	.22½	.25	.20	.25
Phosphate, dibasic tech,						
powd, 325 lb bbls ....lb.	.08	.10	08	.10	.08	.11½
Sulfate, dom, f.o.b., bulk.ton	22.00	24.00	20.00	24.00	22.00	25.00
200 lb bgs ....ton	...	nom.	25.50	25.80	...	25.80
100 lb bgs ....lb.	...	nom.	26.00	26.50	...	26.50
Sulfocyanide, kgs ....lb.	...	.50	...	.50	...	.50
Amyl Acetate (from pentane)						
tks delv ... .lb.	...	.13½	...	.13½	...	.13½
tech, drs, delv ....lb.	.142	.149	.142	.149	.142	.149
secondary, tks, delv ..lb.	...	.108	...	.108	.09	.108
c-l, drs, delv ....lb.	.118	.123	.118	.123	...	.123

g Grain alcohol 20c a gal. higher in each case.

	Current Market		1935		1934	
			Low	High	Low	High
Amyl Chloride, norm drs, wks lb.	.56	.68	.56	.68	.56	.68
Chloride, mixed, drs,						
wks ....lb.	.07	.077	.07	.077	.07	12.2
tks, wks ....lb.	...	.06	...	.06	.06	10.5
Lactate, drs, wks ....lb.	...	.50	...	.50	...	.50
Mercaptan, drs, wks ....lb.	...	1.10	...	1.10	...	1.10
Stearate, drs, wks ....lb.	...	.31	...	.31	...	.31
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.10	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine ....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% ....lb.	...	.75	...	.75	...	.75
40% ....lb.	...	.18	...	.18	...	.18
Anthraqumone, sublimed, 125						
lb bbls ....lb.	.50	.52	.50	.52	.45	.50
Antimony, metal slabs, ton						
lots ....lb.	...	.14	.12½	.15	.07	.14½
Needle, powd, bbls ....lb.	.11½	.13½	.09	.13½	.07	.09
Butter of, see Chloride.						
Chloride, soln cbys ....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls ....lb.	.12¼	.13¼	.10¼	.13¼	.08	.11
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.22	.24
Sulfuret, golden, bbls ...lb.	.22	.23	.19	.23	.16	.23
Vermilion, bbls ....lb.	.35	.42	.35	.42	.35	.42
Archil, conc, 600 lb bbls ..lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ......lb.	.18	.20	.18	.20	.18	.20
Triple, 600 lb bbls ......lb.	.18	.20	.18	.20	.18	.20
Arglos, 80%, casks ....lb.	.15	.16	.15	.16	.15	.16
Crude, 30%, casks ......lb.	.07	.08	.07	.08	.07	.09
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl ....lb.	.08¾	.09¼	.08¾	.09¼	.08¾	.09¼
Arsenic, Red, 224 lb cs kgs lb.	...	.15¾	...	.15¾	.14	.15¾
White, 112 lb kgs ....lb.	.03½	.04½	.03½	.04½	.03½	.05
Metal ....lb.	.40	.42	.40	.42	.40	.45
Asbestine, c-l wks ....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate precip,						
200 lb bgs, wks ......ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat (witherite) 90% gr,						
c-l, wks, bgs ....ton	42.00	45.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs NY lb.	.15½	.17½	.14	.17½	.14	.16
Chloride, 600 lb bbl wks ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.13
Hydrate, 500 lb bbls ....lb.	.05½	.06	.05½	.06	.04¾	.06
Nitrate, 700 lb cks ......lb.	...	.08¼	...	.08¼	...	.08¼
Barytes, floated, 350 lb bbls						
wks ....ton	23.65	31.15	23.00	31.15	23.00	30.50
Bauxite, bulk, mines ......ton	7.00	10.00	7.00	10.00	5.00	10.00
Benzaldehyde, tech, 945 lb						
drs, wks ....lb.	.60	.62	.60	.62	.60	.65
Benzene (Benzol), 90%, Ind,						
8000 gal tks, frt allowed						
..........................gal.	...	.15	...	.15	.15	.20½
90% c-l, drs ....gal.	...	.24	...	.24	...	.24
Ind Pure, tks, frt allowed						
..........................gal.	...	.15	...	.15	.15	.20½
Benzidine Base, dry, 250 lb						
bbls ....lb.	.67	.69	.67	.69	.67	.69
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs..lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl,						
wks ....lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed,						
200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.53	.55	.53	.55	.53	.58
Bismuth metal	.90	1.10	.90	1.20	1.10	1.30
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	...	...
Hydroxide, boxes ....lb.	3.15	3.20	3.15	3.20	...	...
Oxychloride, boxes ......lb.	2.95	3.00	2.95	3.00	...	...
Subbenzoate, boxes ......lb.	3.25	3.30	3.25	3.30	...	...
Subcarbonate, kgs ....lb.	1.40	1.45	1.55	1.70	...	...
Trioxide, powd, boxes ..lb.	3.45	3.50	3.45	3.50	...	...
Subnitrate	1.30	1.35	1.30	1.45	1.40	1.60
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls,						
wks ....ton h	42.50	70.00	42.50	70.00	42.50	70.00
Bleaching Powder, 800 lb drs						
c-l wks contract...100 lb.	...	1.90	...	1.90	...	1.90
lcl, drs, wks ....lb.	2.15	3.50	2.15	3.50	2.00	3.50
Blood, dried, f.o.b., NY..unit	...	2.75	2.50	3.25	2.40	3.25
Chicago, high grade ...unit	...	3.00	2.50	3.75	2.00	3.10
Imported shipt ....unit	...	2.90	2.75	3.10	2.75	3.20
Blues, Bronze Chinese Milori						
Prussian Soluble ......lb.	.36½	.38	.36½	.38	.35½	.38
Bone, 4½ + 50% raw,						
Chicago ....ton	20.00	22.00	19.00	22.00	19.00	25.00
Bone Ash, 100 lb kgs ......lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ....lb.	.05½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp..ton	...	23.00	22.75	24.00	16.00	24.00
Domestic, bgs, Chicago..ton	19.00	20.00	16.00	21.00	...	...
Borax, tech, gran, 80 ton lots,						
sacks, delv ....ton i	...	40.00	36.00	40.00	36.00	36.00
bbls, delv ....ton i	...	50.00	46.00	50.00	46.00	46.00
c-l, sacks, delv ....ton i	...	44.00	40.00	44.00	40.00	40.00
c-l, bbls, delv ....ton i	...	54.00	50.00	54.00	50.00	50.00
Tech, powd, 80 ton lots,						
sacks ....ton i	...	45.00	41.00	45.00	41.00	41.00
bbls, delv ....ton i	...	56.00	51.00	56.00	51.00	51.00
c-l, sacks, delv ....ton i	...	49.00	45.00	49.00	45.00	45.00
c-l, bbls, delv ....ton i	...	59.00	55.00	59.00	55.00	55.00
Bordeaux Mixture, jobbers,						
East, c-l, tins, drs, cases lb.	.08	.16	.08	.16	...	.16
Jobbers, West, c-l ....lb.	.08	.10	.08	.10	...	.10
Dealers, East, c-l ....lb.	.08½	.16½	.08½	.16½	...	.16½
Dealers, West, c-l ....lb.	.09	.11	.09	.11	...	.11

h Lowest price is for pulp, highest for high grade precipitated; i Crystals \$6 per ton higher; USP, \$15 higher in each case.

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Bromine, cases ....lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk ....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks ....lb.	...	.04	...	.04	.02¾	.04
Butyl, Acetate, norm drs, frt allowed ....lb.	.13	.13½	.13	.13½	.11	.14
tks, frt allowed ....lb.	.12	.13	.12	.13	.10	.13
Secondary tks, frt allowed lb.	..	.096	...	.096	.08	.096
drs, frt, allowed ......lb.	.106	.111	.106	.111	...	.111
Aldehyde, 50 gal drs wks lbs.	.19	.21	.19	.21	.19	.36
Secondary, drs ....lb.	.60	.75	.60	.75	.60	.75
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Lactate drs ....lb.	.22½	.23½	.22½	.23½	.22½	.29
Propionate, drs ....lb.	.18	.18½	.18	.18½	.17	.22
tks, delv ....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	...	.26	...	.26	.25	.26
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes...lb.	...	.90	.75	.85	.65	.85
Cadmium Metal ....lb.	.85	.90	.55	.90	.55	.65
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	2.10	2.00	2.10	2.00	3.00
Arsenate, jobbers, East of Rocky Mts, drs ......lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06¼	.07½	.06¼	.07½	...	...
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06½	.06¾	.06¼	.06¾	...	...
Carbide, drs ....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs c-l wks ....ton	...	19.50	...	19.50	...	19.50
Solid, 650 lb drs c-l f.o.b. wks ....ton	...	17.50	...	17.50	...	17.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.17	...	.17	...	.17
Gluconate, tech, 125 lb bbls ....lb.	...	.28	...	.28	.25	.28
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls ....lb.	.21	.22	.20	.22	.19	.20
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls....lb.	.18	.20	.17	.20	.17	.19
Camphor, slabs ....lb.	.49	.50	.49	.52	.51	.59
Powder ....lb.	.49	.50	.50	.52	.51	.59
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	.06½	.07
cartons, delv ....lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv ....lb.	...	.08¼	...	.08¼	...	.08¼
Bisulfide, 500 lb drs....lb.	.05¼	.08	.05¼	.08	.05½	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv ....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom grd lb.	.11½	.12¾	.09½	.15	.09¼	.13
80-100 mesh, c-l, bgs ....lb.	.12	.13¾	.10	.16	.10	.14
Castor Pomace, 5½ NH_3, cl, bgs, wks ....ton	...	16.50	16.50	18.50	...	...
Imported, ship, bgs ....ton	...	18.00	17.25	20.00	...	...
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.13	.18
Transparent, cs ....lb.	...	.20	...	.20	.16	.20
Cellulose, Acetate, 50 lb kgs ....lb.	.55	.60	.55	.60	.55	.90
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks ....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	.12	.18
Willow, powd, 100 lb bbl wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv* ....ton	24.40	25.40	22.40	30.00	...	...
Chestnut, clarified bbls wks lb.	...	.01⅞	...	.01⅞	.01⅝	.01⅞
25% tks wks ....lb.	...	.01½	...	.01½	.01¼	.01½
Pwd, 60%, 100 lb bgs, wks ....lb.	..	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	7.00	9.00
Powdered, bbls ....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks ...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks contract ....lb.	.07½	.08½	.07½	.08½	.07	.08½
cyls, c-l, contract .. lb. j	...	.05½	...	.05½	...	.05½
Liq tk wks contract..100 lb.	...	2.00	...	2.00	1.85	2.00
Multi c-l cyls wks cont..lb.	2.15	2.40	2.15	2.40	2.00	2.40
Chloroacetophenone, tins, wks ....lb.	...	2.00	...	2.00	...	...
Chlorobenzene, Mono, 100 lb drs, lc-l, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ....lb.	.30	.31	.30	.31	.30	.35
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	1.25
Chrome, Green, CP ......lb.	.17	.18½	.17	.30	.20	.30
Yellow ....lb.	.13	.15	.13	.16	.15	.16
Chromium, Acetate, 8% Chrome bbls ....lb.	.05	.05¾	.05	.05¾	.05	.05¾
20° soln, 400 lb bbls .. lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price; * Depends upon point of delivery.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Coal tar, bbls ....bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls ......lb.	...	.60	...	.60	.60	.80
Carbonate tech, bbls ....lb.	1.35	1.40	1.35	1.40	1.34	1.40
Hydrate, bbls ....lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ...lb.	...	.30	...	.30	.30	.40
Resinate, fused, bbls ...lb.	...	.12½	...	.12½	...	.12½
Precipitated, bbls ......lb.	...	.32	...	.32	.32	.42
Cobalt Oxide, black, bgs ..lb.	1.39	1.49	1.25	1.49	1.25	1.35
Cochineal, gray or bk bgs lb.	.32	.36	.32	.39	.33	.42
Teneriffe silver, bgs ....lb.	.33	.37	.33	.40	.34	.43
Copper, metal, electrol 100 lb.	...	9.00	8.00	9.00	7.87½	9.00
Carbonate, 400 lb bbls ..lb.	...	.08¼	...	.08¼	...	.08¼
52-54% bbls ....lb.	.14½	.16¼	.14½	.16¼	.15½	.16
Chloride, 250 lb bbls ...lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs ....lb.	.37	.38	.37	.38	.37	.40
Oleate, precip, bbls .....lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls ..lb.	.15	.17	.15	.17	.12½	.17
black bbls, wks ......lb.	.14½	.15	.14	.16½	...	...
Resinate, precip, bbls ...lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls ...lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-l wks 100 lb	...	3.85	...	3.85	3.75	3.85
Copperas, crys and sugar bulk c-l, wks, bgs ....ton	12.00	13.00	12.00	13.00	12.00	14.50
Corn Syrup, 42 deg, bbls ....100 lb.	...	3.63	3.49	3.63	3.04	3.59
43 deg, bbls ......100 lb.	...	3.68	3.54	3.68	3.09	3.64
Corn Sugar, tanners, bbls ....100 lbs.	...	3.56	3.46	3.66	...	...
Cotton, Soluble, wet, 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls .....lb.	...	.16¾	.16¼	.17¼	.17½	.19½
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ......gal.	.12	.13	.11½	.13	.10	.12½
Grade 2 ....gal.	.109	.12	.10½	.12	.10½	.12
Cresol, USP, drs ....lb.	.11	.11½	.11	.11½	.11	.11½
Crotonaldehyde, 98% 50 gal drs ....lb.	.32	.36	.32	.36	.26	.36
Cudbear, English ....lb.	.19	.25	.19	.25	.19	.25
Philippine, 100 lb bale ..lb.	.03¾	.04¾	.03½	.04¾	.03½	.04¾
Cyanamid, bags c-l frt allowed Ammonia unit	...	1.07½	...	1.07½	...	1.07½
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	4.05	3.95	4.15	3.50	4.20
British Gum, bgs ...100 lb.	4.30	4.50	4.20	4.50	3.75	4.60
White, 140 lb bgs ..100 lb.	4.00	4.10	3.90	4.10	3.47	4.20
Potato, Yellow, 220 lb bgs ....lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl ...lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ....lb.	...	.08	.08	.08¾	.06¾	.08¾
Diamylamine, drs, wks ....lb.	...	1.00	...	1.00	...	1.00
Diamylene, drs, wks ......lb.	.095	.102	.095	.102	.09	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.09	.77
tks, wks ....lb.	...	.075	...	.075	...	...
Diamylphthalate, drs wks gal.	.18	.19½	.18	.20½	...	.20½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls ....lb.	2.25	2.45	2.25	2.45	2.35	2.45
Dibutylphthalate, drs, wks lb.	.20	.21	.20	.23	.20½	.21
Dibutyltartrate, 50 gal drs lb.	.35	.40	.35	.40	.35	.40
Dichlorethylene, drs .....gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks ....lb.	.16	.17	.16	.17	.16	.21
tks, wks ....lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	.15	.23	...	.15
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.0278	.040
tks, wks ....lb.	...	.02½	...	.02½	...	.02½
Diethanolamine, tks ......lb.	...	.30	...	...	...	...
Diethylamine, 400 lb drs ..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs .....lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅜	.35	.31⅜	.35	.31⅜	.35
90% grade, drs ......lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs..lb.	.52	.55	.52	.55	.52	.55
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs ....lb.	.18½	.19	.18½	.27	.26	.27
Diethylsulfate, tech, 50 gal drs ....lb.	...	...	...	...	...	...
Diethyleneglycol, drs .....lb.	.15½	.17½	.15½	.17½	.14	.16
Mono ethyl ethers, drs..lb.	.15	.17	.15	.17	.15	.17
tks, wks ....lb.	...	.15	...	.15	...	...
Mono butyl ether, drs ..lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs wks ....lb.	.20	.24	.20	.27	.26	.27
Diglycol Oleate, bbls .....lb.	.16	.24	.16	.24	.16	.18
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	...	.95	...	.95	.95	1.20
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.29	.30
Dimethyl Ethyl Carbinol, drs ....lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs ...lb.	.20	.21½	.20½	.24½	.24	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls ....lb. *k*	.17	.19½	.17	.19½	.17	.19½
Dintrochlorobenzene, 400 lb bbls ....lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15½	.16½
Diphenyl ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.31	.32	.31	.34
Diphenylguanidine, 100 lb bbl ....lb.	.36	.37	.36	.37	.36	.37

k Higher price is for purified material.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt. ton	36.00	40.00	36.00	40.00	35.00	40.00
Extract .... lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb. cases ... lb.	...	.63	.46	.63	.40	.54
Epsom Salt, tech, 300 lb bbls						
c-l NY .... 100 lb.	1.80	2.00	1.80	2.25	2.20	2.25
USP, c-l, bbls ..... 100 lb.	...	2.00	2.00	2.25	2.25	2.25
Ether, USP anaesthesia 55 lb						
drs .... lb.	.22	.23	.22	.23	.22	.24
(Conc) .... lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed ...... lb.	...	.06	...	.06	...	...
Nitrous, conc, bottles ... lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs .... lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester						
tks .... lb.	.07½	.08	.07½	.08	.07½	.08
drs .... lb.	.08½	.09	.08½	.09	.08½	.09
Anhydrous, tks .... lb.	...	.08½	...	.08½	.08½	.10
drs .... lb.	.09½	.10	.09½	.10	.09½	.10¼
Acetoacetate, 50 gal drs lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drs ..... lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs .... lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys ... lb.	...	.30	...	.30	...	.30
Crotonate, drs .... lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs						
.... lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks ...... lb.	.25	.29	.25	.29	.25	.33
Methyl Ketone, 50 gal drs,						
frt allowed .... lb.	.08½	.09	.08½	.09	.08½	.09
tks, frt allowed ...... lb.	...	.07½	...	.07½	...	...
Oxalate, drs, wks ...... lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs						
wks .... lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb						
drs .... lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal						
cbys chloro, cont ..... lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drs .. lb.	.0545	.0994	.0545	.0994	.0545	.09
Glycol, 50 gal drs, wks lb.	.17	.21	.17	.28	.26	.28
tks, wks .... lb.	...	.16	...	...	...	...
Mono Butyl Ether, drs,						
wks	.20	.21	.20	.21	.20	.21
tks, wks .... lb.	...	.19	...	.19	.19	.19
Mono Ethyl Ether, drs,						
wks	.16	.17	.16	.17	.15	.17
tks, wks .... lb	...	.15	...	.15	.15	.15
Mono Ethyl Ether Acetate, drs, wks	.17½	.18½	.17½	.18½	.16½	.18½
tks, wks .... lb.	...	.16½	...	.16½	.16½	.16½
Mono, Methyl Ether, drs						
wks .... lb.	.19	.23	.19	.23	.21	.23
tks, wks .... lb.	...	.18	...	...	...	...
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl .... lb.	...	.75	...	.75	...	.75
Ethylidenaniline .... lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ..... ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks .... ton	14.00	14.50	14.00	14.50	13.50	14.50
Ferric Chloride, tech, crys,						
475 lb bbls .... lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys .... lb.	.06¼	.06½	.06¼	.06½	...	...
Fish Scrap, dried, unground,						
wks .... unit *l*	...	2.30	2.25	2.90	2.25	2.60
Acid, Bulk, 6 & 3%, delv						
Norfolk & Baltimore basis						
.... unit *m*	...	2.35	2.00	2.35	2.00	2.50
Fluorspar, 98%, bgs	30.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb						
bbls, wks .... lb.	.06	.07	.06	.07	.06	.07
Fossil Flour .... lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines						
.... ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs ..... ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb						
drs .... lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips .... lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes .. lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls .. lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes ...... lb.	.16	.18	.16	.18	.16	.18
Sticks .... ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls .. lb.	.42	.43	.42	.43	.42	.43
Gall Extract .... lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs .. lb.	...	.06	.05	.08	.04	.08
Singapore cubes, 150 lb bgs						
.... 100 lb.	.08	.09	.07⅛	.09⅛	.05	.09⅛
Gelatin, tech, 100 lb cs ... lb.	.50	.55	.50	.55	.45	.55
Glauber's Salt, tech, c-l wks						
.... 100 lb.	1.10	1.30	1.10	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glucose (grape sugar) dry 70-80° bgs, c-l, NY .. 100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb.						
bgs .... 100 lb.	...	2.33	...	2.33	...	2.33
Glue, bone, com grades, c-l						
bgs .... lb.	...	.08	...	.08	.07	.12½
Better grades, c-l, bgs lb.	.09	.09½	.09	.09½	.09½	.16
Casein, kgs .... lb.	.18	.22	.18	.22	.18	.22
Glycerin, CP, 550 lb drs .. lb.	.14	.14½	.14	.14½	.11	.14½
Dynamite, 100 lb drs ... lb.	.13¾	.14¼	.13¾	.14¼	.10	.14¼
Saponification, drs ..... lb.	.10¼	.11½	.10	.11½	.06¾	.10½
Soap Lye, drs .... lb.	.09¼	.09½	.09	.10	.06¼	.09½

l + 10; *m* + 50.

Current

Glyceryl Phthalate
Gum, Yacca

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Glyceryl Phthalate .... lb.	...	.28	...	.28	...	.28
Glyceryl Stearate, bbls.... lb.	...	.18	...	.18	...	.18
Glycol Phthallate .... lb.	...	.29	.28	.29	...	.28
Glycol Stearate .... lb.	...	.23	.18	.23	.18	.20
Graphite,						
Crystalline, 500 lb bbls .... lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls ..... lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls .... lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes .... lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts ...... lb.	.11	.13¾	.09½	.14	.07¾	.10⅝
White sorts, No. 1, bgs .... lb.	.21	.22	.21	.22	...	...
No. 2, bgs .... lb.	.19	.20	.19	.21	...	...
Powd, bbls .... lb.	.15½	.16½	.13½	.16½	...	...
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY .... lb.	.02½	.10½	.02½	.10½	.02½	.10½
Egyptian, 200 lb cases, f.o.b. NY .... lb.	.12	.15	.12	.15	.12	.15
California, f.o.b. NY, drs .... ton	29.00	55.00	29.00	55.00	...	...
Benzoin Sumatra, USP, 120 lb cases .... lb.	.20	.21	.20	.28	.18½	.23
Copal Congo, 112 lb bgs, clean, opaque .... lb.	.19½	.20	.19½	.24⅝	.24⅛	.28
Dark, amber .... lb.	.07¼	.07¾	.07¼	.09¼	.08⅝	.10½
Light, amber .... lb.	.11½	.12	.11½	.14⅞	.14⅜	.19
Copal, East India 180 lb bgs						
Macassar pale bold .... lb.	.10	.10½	.09½	.10¾	.09⅞	.10½
Chips .... lb.	.05½	.06	.05½	.06	...	...
Nubs .... lb.	.08½	.09	.08½	.09	...	...
Dust .... lb.	.04	.04½	.03¾	.04½	...	...
Singapore						
Bold .... lb.	.15⅝	.16⅛	.15⅝	.17	.16	.17
Chips .... lb.	.04⅝	.05⅛	.04⅝	.05⅛	...	...
Nubs .... lb.	.10	.10½	.10	.11	...	...
Dust .... lb.	.04	.04½	.03¾	.04½	...	...
Copal Manilla, 180-190 lb baskets, Loba A ..... lb.	.11¾	.12¼	.11¾	.12¼	.11⅜	.14½
Loba B .... lb.	.11⅛	.12	.10¼	.12	.10¼	.13½
Loba C .... lb.	.10⅛	.10⅝	.10⅛	.11⅜	.09¾	.12
MA sorts .... lb.	.06	.06½	.06	.07¼	.06½	.07½
DBB .... lb.	.08⅜	.08⅞	.08	.08⅞	.08	.09½
Dust .... lb.	.04⅞	.05⅜	.04⅞	.05⅜	...	...
Copal Pontianak, 224 lb cases, bold genuine .... lb.	.14⅜	.14⅞	.14⅜	.16⅝	.16⅛	.19
Mixed .... lb.	.13¼	.14	.12⅞	.14½	...	...
Chips .... lb.	.06⅞	.07¾	.06⅞	.07⅞	...	...
Nubs .... lb.	.09⅝	.10⅛	.09⅝	.10¾	..	...
Split .... lb.	.12⅜	.12⅞	.12⅜	.13⅜	...	...
Dammar Batavia, 136 lb cases						
A .... lb.	.20⅛	.20⅝	.19	.21¼	...	...
B .... lb.	.19⅛	.19⅝	.18	.20¼	...	...
C .... lb.	.16⅛	.16⅝	.16	.18¼	...	...
D .... lb.	.12⅛	.12¾	.11¾	.13⅞	...	...
A/D .... lb.	.14½	.15	.14	.16	...	...
A/E .... lb.	.12⅛	.13⅛	.11¾	.13½	...	...
E .... lb.	.06¾	.07¼	.07	.07¼	.07	.09½
F .... lb.	.06⅜	.06⅞	.06⅛	.06⅞	.05½	.06⅝
Singapore						
No. 1 .... lb.	.16½	.17	.15⅝	.17	.15½	.18
No. 2 .... lb.	.12⅞	.13⅜	.10⅝	.13	.09⅜	.11
No. 3 .... lb.	.04⅞	.05⅜	.04⅝	.05⅞	.05⅛	.07
Chips .... lb.	.09¼	.09¾	.08⅞	.09¾	.09	.10¼
Dust .... lb.	.05	.05½	.04¾	.05¾	.05	.06
Seeds .... lb.	.06¼	.06¾	.04¾	.07¼	.06	.07¾
Ester .... lb.	.07⅝	.08⅜	.07¼	.08⅜	...	...
Elemi, cons .... lb.	.09¾	.10¼	...	...	...	...
Gamboge, pipe, cases ..... lb.	.55	.56	.55	.65	.57	.65
Powdered, bbls .... lb.	.62	.70	.65	.75	.67	.75
Ghatti, sol. bgs .... lb.	.11	.15	.09	.15	.09	.09½
Karaya, pow bbls xxx .... lb.	.24	.25	.23	.25	.23	.25
xx .... lb.	.16	.17	.15	.17	.15	.16
No. 1 .... lb.	.08	.09	.08	.09	.08	.11
No. 2 .... lb.	.07	.08	.07	.08	.07	.09
Kauri, NY, San Francisco,						
Brown XXX, cases .... lb.	.60	.60½	.60	.60½	...	...
BX .... lb.	.33	.33½	.33	.33½	...	...
B1 .... lb.	.19	.19½	.19	.19½	...	...
B2 .... lb.	.14½	.15	.14½	.15	...	...
B3 .... lb.	.12	.12½	.12	.12½	...	...
Pale XXX .... lb.	.65	.65½	.65	.65½	...	...
No. 1 .... lb.	.40	.40½	.40	.40½	...	...
No. 2 .... lb.	.22	.22½	.22	.22½	...	...
No. 3 .... lb.	.15	.15½	.15	.15½	...	...
Kino, tins .... lb.	.70	.80	.70	.80	.75	.80
Mastic .... lb.	.55	.55½	.46	.55½	.35	.55½
Sandarac, prime quality, 200 lb bgs & 300 lb cks ... lb.	.26¼	.26½	.26¼	.35½	.35	.50
Senegal, picked bgs ...... lb.	.20	.21	.20	.21	17	.21
Sorts .... lb.	.11½	.12½	.09⅜	.12½	.08	.10
Thus, bbls .... 280 lbs.	...	11.00	10.50	11.00	9.50	10.75
Strained .... 280 lbs.	...	11.00	10.50	11.00	9.50	10.75
Tragacanth, No. 1, cases .... lb.	1.25	1.30	1.15	1.30	1.00	1.20
No. 2 .... lb.	1.15	1.20	1.05	1.20	...	...
No. 3 .... lb.	1.00	1.05	.95	1.05	...	...
No. 4 .... lb.	.90	.95	.85	.95	...	...
No. 5 .... lb.	.80	.85	.75	.85	...	...
No. 6, bgs .... lb.	.14	.15	.14	.15	...	...
Sorts, bgs .... lb.	.11	.12	.11	.12	...	...
Yacca, bgs............... lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.04

	Current	Market	1935 Low	1935 High	1934 Low	1934 High
Helium, cyl. (200 cu. ft.) cyl.	...	25.00	...	25.00	25.00	25.00
Hematite crystals, 400 lb						
bbls ....lb.	.16	.18	.16	.18	.16	.18
Paste, 500 bbls ....lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb bbls						
wks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.04½
tks ....lb.	...	.02½	...	.02½	...	...
Hexalene, 50 gal drs wks..lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C.						
Group 3, tks ....gal.	...	.14	...	.14	...	.14
Hexamethylenetetramine,						
drs ....lb.	.37	.39	.37	.39	.37	.39
Hexyl Acetate, delv drs ...lb.	.12	.12½	.12	.12½	.12	.12½
tks ....lb.	...	.11½	.	.11½	..	..
Hoof Meal, f.o.b. Chicago unit	...	2.50	2.50	2.70	1.85	2.70
South Amer. to arrive unit	...	1.85	...	1.85	1.65	1.80
Hydrogen Peroxide, 100 vol,						
140 lb cbys ....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride						
......................lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo Madras, bbls ......lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs ....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ....lb.	...	.12	...	.12	...	.12
Iodine, Resublimed, kgs ..lb.	1.65	1.75	...	1.90	1.90	2.30
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.07	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.14	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	..04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English ....lb.	.07½	.08¾	.07½	.08¾	.07½	.09
Isobutyl Carbinol (128-132°C)						
drs, wks ....lb.	.33	.34	.33	.34	.34	.34
tks, wks ....lb.	...	.32	...	.32	.32	.326
Isopropyl Acetate, tks ....lb.	...	.07½	...	.07½	.07	.07½
drs, frt allowed ....lb.	.08½	.09	.08½	.09	...	...
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY,						
Brown ....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken,						
f.o.b. NY, bbls ...... lb.	...	.09½	...	.09½	.09½	.09½
White, broken, bbls ....lb.	...	.11	...	.11	.11	.11
cryst bbls ....lb.	...	.10½	...	.10½	.10½	.10½
gran, bbls ....lb.	...	.11	...	.11	.11	.11
powd, bbls ....lb.	...	.11¼	...	.11¼	.11¼	.11¼
Arsenate, East, jobbers,						
drs ....lb.	.09	.09½	.09	.09½	...	...
Dealers, drs ....lb.	.09¼	.10½	.09¼	.10½	...	...
West, jobbers, drs .....lb.	...	.09	...	.09	...	...
dealers, drs ....lb.	...	.10	...	.10	...	...
Linoleate, solid bbls ......lb.	.26	.26½	.26	.26½	.26	.26½
Metal, c-l, NY ....100 lb	...	4.50	3.50	4.50	3.50	4.25
Red, dry, 95% Pb_3O_4,						
delv ....lb.	.07	.08	.06	.08	.06	.07¾
97% Pb_3O_4, delv .....lb.	.07¼	.08¼	.06¼	.08¼	...	...
98% Pb_3O_4, delv ....lb.	.07½	.08½	.06½	.08½	...	...
Nitrate, 500 lb bbls, wks..lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls ....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	.14	.18½
Stearate, bbls ....lb.	.22	.23	.22	.23	.22	.23
White, 500 lb bbls, wks..lb.	.06½	.07	.06½	.07	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06	...	.06	...	.06
Lime, chemical quicklime,						
f.o.b., wks, bulk .....ton	7.00	7.25	7.00	7.25	...	...
Hydrated, f.o.b., wks ..ton	8.50	12.00	8.50	12.00	...	...
Lime Salts, see Calcium Salts.						
Lime sulfur, sol, jobbers,						
tks ....gal.	...	.10	...	.10	...	...
drs ....gal.	.13½	.15½	.13½	.15½	...	...
Dealers, tks ....gal.	...	.10½	...	.10½	...	...
drs ....gal.	.14	.16½	.14	.16½	...	...
Linseed Meal, bgs ....ton	...	29.50	25.50	40.00	30.50	41.00
Litharge, coml, delv, bbls..lb.	.06	.07	.05	.07	.051	.06¾
Lithopone, dom, ordinary,						
delv, bgs ....lb.	.04½	.04¾	.04½	.04¾	.04½	.04¾
bbls ....lb.	.04¾	.05	.04¾	.05	.04¾	.05
High strength, bgs .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Titanated, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.08½	.10½	.08½	.10½	.08½	.12½
Solid, 50 lb boxes ......lb.	.13½	.17½	.13½	.17½	.13½	.17½
Sticks ....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	55.00	65.00
Magnesium Carb, tech, 70 lb						
bgs, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs, c-l.						
wks ....ton	36.00	39.00	36.00	39.00	34.00	39.00
Magnesium fluosilicate, crys,						
400 lb bbls, wks .... lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb.						
bbls ....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls .. lb.	...	.50	...	.50	...	.50
Palmitate, bbls ....lb.	.23	.24	.22	.24	.21	.23
Stearate, bbls ....lb.	.20	.22	.19	.22	...	...
Linoleate, lig drs ......lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls ....lb.	...	.12	...	.12	.11½	.12½
Manganese Borate, 30%, 200						
lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.07	.12
Dioxide, tech (peroxide),						
paper bgs, c-l ....ton	...	50.00	45.00	50.00	...	...
Mangrove 55%, 400 lb bbls lb.	..	.04	...	.04	.	04
Bark, African ....ton	27.00	28.00	27.00	30.00	26.00	32.00
Marble Flour, blk ....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride ....lb.	.71	.76	.71	.93	.73	.93

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Mercury metal ... 76 lb. flasks	69.50	71.50	69.00	76.50	66.50	79.00
Meta-nitro-aniline .... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls .... lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls .... lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs .... lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls ..... lb.	.09	.10	.09	.10	.09	.11
Stearate, bbls .... lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb bbls .... lb.	.67	.69	.67	.69	.67	.69
Methanol, 95%, frt allowed, drs .... gal. *o*	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed .... gal. *o*	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal. *o*	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed .... gal. *o*	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed .... gal. *o*	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed, drs .... gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed .... gal. *o*	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-100%, drs .... lb.	.18	.18½	.18	.18½	.18	.18½
Synthetic, 410 lb drs ... lb.	.16	.17	.16	.17	.16	.17
tks .... lb.	...	.15	...	.15	.15	.15
Acetone, frt allowed, drs .... gal. *p*	.49½	.68½	.49½	.73½	...	...
tks, frt allowed, drs gal. *p*	.44	...	.44	.52½	...	...
Synthetic, frt allowed, east of Rocky M., drs gal. *p*	.57½	.60	.57½	.60	.57½	.60
tks, frt allowed	...	.53	...	.53	...	...
West of Rocky M., frt allowed, drs .... gal. *p*	.60	.63	.60	.63	...	...
tks, frt allowed .. gal. *p*	...	.56	...	.56	...	..
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	.60	1.20
Anthraquinone .... lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks ...... lb.	...	.10½	...	.10½	.10½	.10½
Chloride, 90 lb cyl ..... lb.	...	.45	...	.45	.45	.45
Ethyl Ketone, tks ..... lb.	...	.07½	...	.07½	.07½	.07½
Propyl carbinol, drs ... lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks .. lb.	35.00	..	35.00	...	...	...
Michler's Ketone, kgs .... lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY .... gal.	.08	.08¼	.07¾	.08¼	.06	.09
Monoamylamine, drs, wks lb.	...	1.00	...	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.						
Monoethanolamine, tks, wks lb.	...	.30	...	...	...	...
Monomethylparaminosulfate, 100 lb drs .... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls.. lb.	...	.04¼	...	.04¼	.03¾	.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs .... ton	23.50	24.50	23.50	27.00	24.50	32.00
J2 bgs .... ton	...	14.75	15.00	15.75	15.75	18.00
R2 bgs .... ton	...	15.25	16.00	16.50	16.25	18.00
Naphtha. v.m. & p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks .... gal.	...	.30	.26	.30	.26	.30
drs, c-l .... gal.	...	.35	.31	.35	.31	.35
Naphthalene, dom, crude, bgs, wks .... lb.	1.95	2.30	1.65	2.40	..	...
Imported, cif, bgs .... lb.	...	1.95	1.90	1.95	1.75	1.90
Dyestuffs, bgs, bbls, Eastern wks .... lb.	.04¼	.04¾	.04¼	.04¾	...	...
Balls, ref'd, bbls, Eastern wks .... lb.	.04½	.05¼	.04½	.05¼	...	...
Flakes, ref'd, bbls, Eastern wks .... lb.	.04½	.05¼	.04½	.05¼	...	...
Dyestuffs, bgs, bbls, Mid-West wks .... lb. *q*	.04¾	.05¼	.04¾	.05¼	...	...
Balls, ref'd, bbls, Mid-West wks .... lb. *q*	.05	.05¾	.05	.05¾	...	...
Flakes, ref'd, bbls, Mid-West wks .... lb. *q*	.05	.05¾	.05	.05¾	...	...
Nickel Chloride, bbls ..... lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY.. lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY ... lb.	.12½	.13	.12½	.13	.11½	.13
Single, 400 lb bbls, NY lb.	.11½	.12	.11½	.12	.11½	.12
Metal ingot .... lb.	...	.35	...	.35	.35	.35
Nicotine, free 50%, 8 lb tins, cases	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs ...... lb.	.77	.80	.67	.80	.67	.75
Nitre Cake, blk .... ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks .... lb.	.09	.11	.09	.11	.09	.11
tks .... lb.	...	.08½	...	.08½	...	.08½
Nitrocellulose, c-l-l cl, wks lb.	.27	.34	.27	.34	.27	.34
Nitrogenous Mat'l, bgs, imp unit	...	2.35	2.20	2.75	...	...
dom, Eastern wks .... unit	...	2.20	2.20	2.40	2.35	3.25
dom, Western wks .... unit	...	1.90	1.90	2.30	...	...
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs ..... lb.	.16	.18	.12	.18	.18	.20
Chinese, bgs .... lb.	.19	.20	.19	.20	.17	.20
Oak Bark Extract, 25%, bbls lb.	...	.03½	...	.03½	.03⅜	.03½
tks .... lb.	...	.02¾	...	.02¾	...	...
Octyl Acetate, tks, wks ... lb.	...	.15	...	...	...	...
Orange-Mineral, 1100 lb cks NY .... lb.	.10	.10½	.09¼	.10½	.09¼	.10½
Orthoaminophenol, 50 lb kgs. lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.82	.84	.82	.84	.82	1.15
Orthochlorophenol, drs .... lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs .... lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb drs .... lb.	.05½	.06	.05½	.06	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current Market		1935		1934	
			Low	High	Low	High
Orthonitrochlorobenzene, 1200 lb drs, wks .... lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks .... lb.	.07	.10	.05½	.10	.05½	.06
Orthonitrophenol, 350 lb drs .... lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l .... lb.	.14½	.15	.14½	.15	.14	.15
Orthonitroparachlorphenol, tins .... lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst .... lb.	.17	.25	.17	.25	.16	.25
51 deg liquid .... lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs ...... lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs						
122-127 deg M P .... lb.	.04	.04¾	.04	.04¾	.04½	.04¾
128-132 deg M P .... lb.	.05	.0515	.05	.0515	.04¾	.0515
133-137 deg M P .... lb.	.0575	.06	.0575	.06	.05	.06
Para aldehyde, 110-55 gal drs .... lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs .... lb.	...	.85	...	.85	.52	.85
Aminohydrochloride, 100 lb kgs .... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	.78	1.05
Chlorophenol, drs ...... lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs .. lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr .... gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene 150 lb bbls wks .... lb.	.16	.20	.16	.20	.16	.20
Formaldehyde, bbls, wks lb.	.38	.39	.38	.39	...	...
Nitroacetanilid, 300 lb bbls .... lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks .... lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks .... lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls .... lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls .... lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.35	.37	.35	.37	.35	.37
Phenylenedamine, 350 lb bbls .... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs .... lb.	.32	.50	.32	.50	.32	.50
Toluenesulfonamide, 175 lb bbls .... lb.	.70	.75	.70	.75	.70	.75
tks, wks .... lbs.	...	.31	...	.31	...	...
Toluenesulfonchloride, 410 lb bbls, wks .... lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks .... lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kgs .... lb.	...	.24	...	.24	.23	.24
250 lb kgs .... lb.	...	.22	...	.22	...	.22
Perchlorethylene, 50 gal drs .... lb.	...	.15	...	.15	...	.15
Persian Berry Ext, bbls .. lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C, group 3 tks .... gal.	...	.09	...	.09	.09	.09
drs, group 3 .... gal.	.10	.15	.10	.15	...	...
Petrolatum, dark amber, bbls .... lb.	.02⅝	.02⅞	.02	.02⅞	...	...
Light, bbls .... lb.	.03⅛	.03⅜	.02½	.03⅜	...	...
Medium, bbls .... lb.	.02⅞	.03⅛	.02¼	.03⅛	...	...
Dark green, bbls .... lb.	.02½	.02¾	.02½	.02¾	...	...
White, lily, bbls .... lb.	.06	.06¼	.05¼	.06½	...	...
White, snow, bbls ...... lb.	.07	.07¼	.06¼	.07½	...	...
Red, bbls .... lb.	.02⅝	.02⅛	.02¼	.02⅞	...	...
Petroleum Ether, 30-60°, group 3, tks .... gal.	...	.13	...	.13	.11	.13
drs, group 3 .... gal.	.15	.16	.15	.16	.15	.17

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1935		1934	
			Low	High	Low	High
Cleaners naphthas, group 3, tks, wks .... gal.	.06⅞	.07¼	.06⅞	.07¼	...	...
Bayonne, tks, wks .. gal.	...	.09	...	.09	...	...
West Coast, tks .... gal.	...	.15	...	.15	...	...
Hydrogenated naphthas, frt allowed East, tks ... gal.	...	.17½	...	.17½	...	...
No. 2, tks .... gal.	...	.22½	...	.22½	...	...
No. 3, tks .... gal.	...	.17½	...	.17½	...	...
No. 4, tks .... gal.	...	.22½	...	.22½	...	...
Lacquer diluents, tks, Bayonne .... gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks .... gal.	.07⅞	.08	.07⅞	.08	.06⅞	.08⅜
Naphtha, V.M.P., East, tks, wks .... gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ... gal.	.06⅞	.07¼	.06⅞	.07¼	.06¼	.07¼
Petroleum thinner, East, tks, wks .... gal.	...	.09	...	.09	.09	.09
Group 3, tks, wks ... gal.	.05⅞	.06⅛	.05⅞	.06¼	.05⅞	.06⅜
Rubber Solvents, stand grd, East, tks, wks ...... gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks .. gal.	.06⅞	.07¼	.06⅞	.07¼	.06⅜	.06⅞
Stoddard Solvent, East, tks, wks .... gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ... gal.	.06⅜	.07	.06⅜	.07	.05¾	.07⅛
Phenol, 250-100 lb drs .... lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs .... lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs ..... lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride .... lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins .. lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins .... lb.	20.00	22.00	20.00	22.00	20.00	22.00

Current

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ....ton	...	3.40	3.25	3.40	2.85	3.25
70% basis ....ton	...	3.90	...	3.90	3.35	3.90
72% basis ....ton	...	4.40	...	4.40	3.85	4.40
75-74% basis ....ton	...	5.40	...	5.40	4.90	5.40
75% basis ....ton	...	5.50	...	5.50	5.05	5.50
77-80% basis ....ton	...	6.50	...	6.50	5.90	6.50
Tennessee, 72% basis ..ton	...	4.75	...	4.75	4.75	5.00
Phosphorous Oxychloride 175 lb cyl ....lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ......lb.	.44	.45	.44	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.44	.46	.44	.50	.48	.62
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks ....gal.	...	.59	...	.59	...	...
Straw color, bbls ......gal.	...	.59	...	.59	...	...
tks ....gal.	...	.54	...	.54	...	...
Pitch Hardwood, wks ....ton	...	15.00	15.00	20.00	...	20.00
Burgundy, dom, bbls, wks ....lb.	...	.03½	...	.03½	...	...
Imported ....lb.	.11	.13	.11	.13	...	...
Coaltar, bbls, wks .....ton	...	19.00	...	19.00	...	...
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	3.75	4.25	3.75	4.25	...	...
Stearin, drs ....lb.	.03	.04½	.03	.04½	...	...
Platinum, refd ....oz.	34.50	38.00	35.00	38.00	35.00	38.00
POTASH						
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.07⅜
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.08¼
Liquid tks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.03⅝
Potash Salts, Rough Kainit 14% basis ....ton	...	8.50	...	8.50	8.50	9.70
Manure Salts, imported						
20% basis, blk ....ton	...	11.00	8.60	11.00	8.60	12.00
30% basis, blk ....ton	...	14.40	12.90	14.40	12.90	19.15
Domestic, cif ports, blk unit	...	.43	...	.43	...	..
Potassium Acetate ....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis bgs ....ton	...	22.50	22.00	22.50	22.00	37.15
Dom, blk ....unit	...	.45	.40	.45	...	...
Pot & Mag Sulfate, 48% basis bgs ....ton	22.25	22.50	19.50	22.50	22.50	25.00
Potassium Sulfate, 90% basis bgs ....ton	...	33.75	33.75	35.00	35.00	42.15
Potassium Bicarbonate, USP 320 lb bbls ....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb cks ....lb.	.08⅛	.08⅝	.08⅛	.08⅝	.08⅛	.08⅝
Binoxalate, 300 lb bbls..lb.	.22	.23	.22	.23	.14	.23
Bisulfate, 100 lb kgs ..lb.	.35	.36	.35	.36	.33	.36
Carbonate, 80-85% calc 800 lb cks ....lb.	.07¼	.07½	.07½	.07⅞	.07	.07⅞
liquid, tks ....lb.	...	..	...	...	...	...
drs, wks ....lb.	.03½	.03¾	...	...	...	...
Chlorate crys, powd, 112 lb kgs, wks ....lb.	...	.09¾	...	.09¾	.08½	.09¾
gran, kgs ....lb.	.12	.13	.12	.13	...	...
powd, kgs ....lb.	.08¾	.09¾	.08¾	.09¾	...	...
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.60
Iodide, 75 lb bbls ......lb.	...	1.25	1.25	1.40	1.40	2.70
Metabisulfite, 300 lb bbls lb.	...	.15	...	.15	.10½	.15
Oxalate, bbls ....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, cks, wks .. lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, 112 lb kgs lb.	.35	.38½	.35	.38½	.35	.39
Yellow, 500 lb casks ..lb.	.18	.19	.18	.19	.18	.19
Tartrate Neut, 100 lb kgs lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls ....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks	...	.07	...	.07	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls ....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs ......lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs .....100 lb.	...	2.75	...	2.75	2.25	2.75
Linseed Oil, kgs ...100 lb.	...	4.50	...	4.50	4.00	4.50
Pyridine, 50 gal drs .....gal.	...	1.25	...	1.25	...	1.25
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins ....lb.	2.75	3.00	2.75	3.00	2.75	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅝	...	.02⅝	.02¼	.02⅝
450 lb bbls, c-l ......lb.	...	.03⅛	...	.03⅛	.02¾	.03⅛
Solid, 63%, 100 lb bales cif ....lb.	...	.03⅝	...	.03⅝	.02⅞	.03⅝
Clarified, 64%, bales..lb.	...	.03⅞	...	.03⅞	.03	.03⅞
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.06	.06½	.06	.06½	.05½	.06½
Solid, 100 lb boxes .....lb.	.10	.12	.10	.12	.09½	.13
R Salt, 250 lb bbls, wks ..lb.	.44	.45	.44	.45	.40	.45
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.65	.80
Rochelle Salt, cryst ......lb.	.14	.14½	.14	.15	.12½	.16
Powd, bbls ....lb.	.13	.13½	.13	.13½	...	...
Rosin Oil, bbls, first run gal.	...	.38	.36	.45	.45	.48
Second run ....gal.	...	.45	.43	.48	.48	.53
Third run, drs ....gal.	...	.53	.50	.60	...	...

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	5.35	4.65	5.25	4.50	5.75
D	...	5.35	5.02½	5.25	4.60	5.85
E	...	5.45	5.15	5.45	4.80	6.50
F	...	5.55	5.20	5.90	5.00	6.75
G	...	5.55	5.25	5.95	5.05	6.75
H	...	5.55	5.25	5.97½	5.10	6.75
I	...	5.55	5.25	6.00	4.05	5.20
K	...	5.55	5.27½	6.00	5.30	6.75
M	...	5.60	5.35	6.02½	5.45	6.80
N	...	6.10	5.75	6.40	5.50	6.80
WG	...	6.25	5.95	6.87½	5.70	6.80
WW	...	6.65	6.25	7.55	5.90	6.85
Rosins, Gum, Savannah (280 lb unit):						
B	...	4.10	3.40	4.00	...	...
D	...	4.10	3.70	4.20	...	...
E	...	4.20	3.90	4.20	...	...
F	...	4.30	3.95	4.65	...	...
G	...	4.30	4.00	4.75	...	...
H	...	4.30	4.00	4.75	...	...
I	...	4.30	4.00	4.75	...	...
K	...	4.30	4.02½	4.75	...	...
M	...	4.35	4.10	4.75	...	...
N	...	4.85	4.50	5.15	...	...
WG	...	5.00	4.70	5.60	...	...
WW	...	5.40	5.15	6.25	...	...
X	...	5.40	5.20	6.25	...	...
Rosins, Wood, wks (280 lb unit), wks, FF	...	4.25	4.05	6.35	...	...
I	...	4.40	4.30	7.00	...	...
M	...	4.90	4.55	7.25	...	...
N	...	5.25	5.00	7.75	...	...
Rosin, Wood. c-l, FF grade, NY	...	5.02	4.92	5.30	5.10	6.13
Rotten Stone, bgs mines ..ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls ..lb.	.05	.07	.05	.07	.05	.07
Selected, bbls ....lb.	.08	.10	.08	.10	.08	.12
Powdered, bbls ....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02½	.03¾
Sal Soda, bbls, wks ..100 lb.	...	1.30	...	1.30	1.10	1.30
Salt Cake, 94-96%, c-l, wks ....ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome, c-l, wks ......ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls ......lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls ....lb.	.069	.07⅞	.069	.07⅞	...	...
Cryst, bbls ....lb.	.069	.08	.069	.08	...	...
Satin, White, 550 lb bbls ..lb.	...	.01½	...	.01½	...	.01½
Shellac, Bone dry, bbls ..lb. r	.23	.25	.19	.32	.26	.37
Garnet, bgs ....lb.	.19	.20	.17	.27	.26	.32
Superfine, bgs ....lb. s	.16½	.28	.16	.28	.23	.31
T. N., bgs ....lb. s	.14½	.16	.13	.25	...	...
Schaeffer's Salt, kgs ......lb.	.48	.50	.48	.50	.48	.50
Silver Nitrate, vials ......oz.	...	.44⅝	.38	.53¾	.31⅞	.40½
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.25
blk ....100 lb.	...	1.05	...	1.05	...	1.05
paper bgs ....100 lb.	...	1.20	...	1.20	...	1.20
bbls ....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs ....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	.03	.08
Acetate, tech, 450 lb bbls, wks ....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs ....lb.	...	.64	...	.64	.50	.64
Arsenate, drs ....lb.	...	.10½	...	.10½	.07¾	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs .. lb.	.46	.48	.46	.48	.45	.48
Bicarb, 400 lb bbl, wks 100 lb.	...	1.85	...	1.85	1.85	1.85
Bichromate, 500 lb cks, wks ....lb.	.06⅛	.06⅝	.06⅛	.06⅝	.06⅛	.06⅝
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	...	...
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech ....ton	13.60	16.50	13.60	16.50	11.40	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks ....lb.	.07¼	.08¼	.07¼	.08¼	.07¼	.09½
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.18	.19	.18	.21	.19½	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.40	3.00
Tech, reg cryst, 375 lb bbls, wks ......100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide ....lb.	2.00	2.05	2.00	2.40	2.40	3.50
Metanilate, 150 lb bbls ..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ....100 lb.	2.65	3.05	2.65	3.05	2.65	3.05
cryst, bbls, wks ..100 lb.	...	3.25	...	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.02½	...	.02½	...	.02½
Napthenate, drs .... lb.	...	.09	...	.09	.09	.13
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ....ton	...	24.80	...	24.80	24.80	26.30
100 lb bgs ....ton	...	25.50	...	25.50	25.50	27.00
Bulk ....ton	...	23.50	...	23.50	23.50	24.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

Current

Sodium Nitrite
Thiocarbanilid

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Sodium (continued)						
Nitrite, 500 lb bbls ....lb.	.07¼	.08	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls ..lb.	.17	.18	.17	.19	.18	.19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.30	2.20	2.30	2.10	2.40
bgs, wks ......100 lb.	...	2.10	2.00	2.10	...	...
tri-sodium, tech, 325 lb bbls, wks ......100 lb.	...	2.70	2.60	2.70	2.60	2.70
bgs, wks ......100 lb.	...	2.50	2.50	2.60	...	...
Picramate, 160 lb kgs ..lb.	.67	.69	.67	.69	.69	.72
Prussiate, Yellow, 350 lb bbl, wks ....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, anhyd, 100 lb bbls ....lb.	.102	.132	.102	.15	...	.15
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.04½	.04¾	.04¼	.04¾	.04¾	.06
Stannate, 100 lb drs ....lb.	.32½	.35½	.31	.38	.33½	.37½
Stearate, bbls ....lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l, wks ....100 lb. †	1.30	1.55	1.25	2.35	2.20	2.85
Sulfide, 80% cryst, 440 lb bbls, wks ....lb.	...	.02¼	...	.02¼	.02¼	.02½
62% solid, 650 lb drs, c-l, wks ....lb.	...	.03	...	.03	...	.03
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.02½	.023	.02½	.02¼	.02½
Sulfocyanide, bbls .....lb.	.32	.42½	.32	.42½	.28	.42½
Tungstate, tech, crys, kgs ....lb.	...	.90	...	.90	.70	.90
Spruce Extract, ord, tks ..lb.	...	.01	...	.01	...	.01
Ordinary, bbls ....lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks .. lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, bbls ..lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs ....100 lb.	3.58	3.78	3.36	3.78	2.81	3.76
Powd, 140 lb bgs ...100 lb.	3.68	3.88	3.46	3.66	2.71	3.66
Potato, 200 lb bgs ......lb.	.04½	.05½	.04½	.06	.05¼	.06
Imp, bgs ....lb.	.05¾	.06	.05¾	.06½	.06	.06½
Rice, 200 lb bbls ....lb.	...	.07¼	.07¼	.08½	.07½	.08½
Wheat, thick bgs ....lb.	...	.08¼	...	.08¼	.06¼	.08¼
Strontium carbonate, 600 lb. bbls, wks ....lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY ....lb.	.08¾	.09½	.08¾	.09½	.08¾	.11
Sulfur	...	...	...	...	...	...
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Superfine, bgs .....100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, red, 700 lb drs, wks ....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl lb.	.08½	.10	.08½	.10	.07	.10
Multiple units, wks ... lb.	...	.06½	...	.06½	...	...
tks, wks ....lb.	...	.04¾	...	.04¾	...	...
Refrigeration, cyl, wks ...lb.	...	.13	...	.13	...	...
Multiple units, wks ....lb.	...	.09¼	...	.09¼	...	...
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ......ton	...	60.00	50.00	62.00	58.00	75.00
dom, bgs, wks ....ton	...	35.00	...	35.00	...	...
Superphosphate, 16% bulk, wks ....ton	...	8.50	8.25	8.50	8.00	8.50
Run of pile ....ton	...	8.00	7.75	8.00	7.50	8.00
Talc, Crude, 100 lb bgs, NY ....ton	14.00	15.00	14.00	15.00	12.00	15.00
Refd, 100 lb bgs, NY ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bgs, NY ton	22.00	30.00	22.00	30.00	27.50	30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	70.00	75.00	70.00	75.00	70.00	75.00
Refd, white, bgs, NY ton	75.00	80.00	75.00	80.00	75.00	80.00
Tankage Grd, NY ....unit *	2.35	2.50	2.35	2.75	2.50	3.25
Ungrd ....unit *	2.15	2.25	2.15	2.50	2.00	2.75
Fert grade, f.o.b. Chicago ....unit *	...	2.65	2.25	2.65	1.80	2.40
South American cif..unit *	2.75	2.85	2.45	3.15	2.75	3.10
Tapioca Flour, high grade, bgs ....lb.	.0215	.05	.0215	.05	.0215	.05
Tar Acid Oil, 15%, drs gal.	.22	.23	.21	.23	.21	.22
25%, drs ....gal.	.24	.25	.23	.25	.23	.24
Tar, pine, delv, drs .....gal.	.25	.26	.25	.26	...	...
tks, delv ....gal.	...	.20	...	.20	...	...
Tartar Emetic, tech ......lb.	.24¾	.25	.22¾	.25	.23	.23
USP, bbls ....lb.	.28	.28½	.28	.28½	.27	.28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	...	...
tks ....lb.	.13	.14	.13	.14	...	...
Tetrachlorethane, 50 gal drs lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl lb.	.20	.25	.20	.25	.20	.25

† Bags 15c lower; * + 10.

Tin Crystals
Zinc Stearate

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Tin, crystals, 500 lb bbls, wks ....lb.	.37½	.38	.36	.39½	.30	.40½
Metal, NY ....lb.	...	.49⅞	.456	.52	.50⅞	.55⅜
Oxide, 300 lb bbls, wks lb.	.54	.56	.51	.58	.55	.60
Tetrachloride, 100 lb drs, wks ....lb.	...	.25¼	.24¾	.26½	.25½	.28½
Titanium Dioxide, 300 lb bbls ....lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Calcium Pigment, bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks ....lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.85
Para, red, bbls ....lb.	...	.75	...	.75	.75	.80
Toluidine, bgs ....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks lb.	...	.40	...	.40	...	.40
Triamylamine, drs, wks ...lb.	...	1.25	...	1.25	1.00	1.25
Trichlorethylene, 50 gal drs lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs wks ....lb.	.26	.30	.26	.38	.35	.38
tks, wks ....lb.	...	.25	...	...	...	...
Tricresyl Phosphate, drs ..lb.	.21	.23	.21	.23	.19	.26
Triphenyl Guanidine ....lb.	.58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ....ton	27.50	30.00	27.50	30.00	...	...
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	12.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.47¼	.43¾	.55½	.46¼	.63½
Savannah, bbls ....gal.	...	.42¼	.38¾	.50¼	.41¼	.58½
Jacksonville, bbls ....gal.	...	.42	.38¾	.50¼	.41¼	.58½
Wood Steam dist, bbls, c-l, NY ....gal.	...	.43	.43	.49	.41	.61
Urea, pure, 112 lb cases ..lb.	.15½	.17	.15½	.17	.15	.17
Fert grade, bgs c.i.f. ..ton	100.00	120.00	100.00	120.00	90.00	120.00
c.i.f. S.A. points ....ton	100.00	120.00	100.00	120.00	90.00	120.00
Urea Ammonia liq 55% NH_3, tks ....unit	...	.96	...	.96	...	.96
Valonia beard, 42%, tannin bgs ....ton	...	43.00	40.00	43.50	39.00	48.00
Cups, 32% tannin, bgs..ton	...	27.50	26.00	28.50	23.00	32.50
Mixture, bark, bgs ....ton	...	32.00	...	32.00	..	32.00
Vermillion, English, kgs ..lb.	1.48	1.61	1.48	1.70	1.41	1.73
Vinyl Chloride, 16 lb cyl ..lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bgs ....ton	29.00	30.00	29.00	32.00	29.50	34.00
Extract, 60°, tks, bbls ..lb.	...	.03¾	...	.03¾	.03⅝	.03⅞
WAXES						
Wax, Bayberry, bgs ....lb.	.17½	.20	.17½	.23	.25	.30
Bees, bleached, white 500 lb slabs, cases ....lb.	.33½	.34	.33½	.34	.32	.37
Yellow, African, bgs ..lb.	.22	.23	.21	.23	.16	.22
Brazilian, bgs ....lb.	.21½	.23½	.21½	.25	...	...
Chilean, bgs ....lb.	.21½	.23½	.21½	.24½	...	...
Refined, 500 lb slabs, cases ....lb.	.27½	.28	.27½	.28	.21	.29
Candelilla, bgs ....lb.	.16	.17½	.10	.17½	.10¼	.14½
Carnauba, No. 1, yellow, bgs ....lb.	.49	.52	.35	.52	.30	.40
No. 2, yellow, bgs ....lb.	.47	.50	.34	.51	.34	.41
No. 2, N. C., bgs ....lb.	.41	.43	.26½	.43½	.20	.29
No. 3, Chalky, bgs ...lb.	.38	.41	.21	.42½	...	...
No. 3, N. C., bgs ....lb.	.38½	.41½	.22½	.43	.16¼	.25
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	...	...
Yellow, bgs ....lb.	.36	.38	.36	.38	...	...
Domestic, bgs ....lb.	.08	.11	.08	.11	...	...
Japan, 224 lb cases ....lb.	.08	.08¼	.06	.08¼	.06	.07½
Montan, crude, bgs ....lb.	.10¾	.11¾	.10½	.11¾	.10	.11
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.22	.24	.19	.24	.18	.20
Cakes, cases ....lb.	.23	.25	.20	.25	.19	.21
Whiting, prec 200 lb bgs, c-l, wks ....ton	...	15.00	12.00	15.00	...	...
Alba, bgs, c-l, NY ....ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, NY ...ton	...	15.00	...	15.00	...	...
Wood Flour, c-l, bgs ....ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks ....gal.	.31	.33	.27	.33	.27	.29
Coml, tks, wks, frt allowed ....gal.	...	.30	.26	.30	...	.26
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY ....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride fused, 600 lb drs, wks ....lb.	.04½	.05¾	.04½	.05¾	.04¼	.05¼
Gran, 500 lb bbls, wks ..lb.	.05	.05¾	.05	.05¾	.05⅛	.06
Soln 50%, tks, wks..100 lb.	...	2.00	...	2.00	...	2.00
Cyanide, 100 lb drs ....lb.	.36	.41	.36	.41	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv ....lb.	...	.06¾	.057	.06¾	.0567½	.071
Metal, high grade slabs, c-l, NY ....100 lb.	...	5.12	4.05	5.12	4.05	4.75
E. St. Louis ....100 lb.	...	4.75	3.70	4.75	3.70	4.46
Oxide, Amer, bgs, wks..lb.	.05	.05½	.05	.06¼	.05¾	.06¼
French, 300 lb bbls, wks ....lb.	.05½	.07	.05½	.10⅞	.05¾	.11⅛
Palmitate, bbls ....lb.	.22	.23	.21	.23	.20	.22
Perborate, 100 lb drs .. lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs .. lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls ....lb.	.19	.22	.18	.22	.18	.21

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Zinc Sulfate, crys, 400 lb bbl, wks ... lb.	.028	.033	.028	.033	.02¾	.033
Flake, bbls ... lb.	.035	.032	.035	.032	...	...
Sulfide, 500 lb bbls, delv lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.13½
bgs, delv ... lb.	.10½	.11½	.10½	.11½	...	...
Sulfocarbolate, 100 lb kgs ... lb.	.24	.25	.24	.25	.21	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs ... lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs ... lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

Castor, No. 3, 400 lb bbls .. lb.	.09¾	.10½	.09¾	.10½	.09¾	.10½
Blown, 400 lb bbls ... lb.	.11½	.12¼	.11½	.16	.11½	12¾
China Wood, bbls spot NY lb.	.35	.40	.094	.40	.07½	.099
Tks, spot NY ... lb.	...	.35	.088	.35	.07¼	.094
Coast, tks ... lb.	...	.24	.087	.24	.06⅞	.094
Coconut, edible, bbls NY .. lb.	...	.10	.04	.12	.04¾	.10¾
Manila, tks, NY ... lb.	...	.04⅜	.03¾	.06¼	.02⅝	.03¾
Tks, Pacific Coast ... lb.	...	.03⅞	.03⅜	.06	.02¼	.02½
Cod, Newfoundland, 50 gal bbls ... gal.	.34	.35	.34	.38	.34	.40
Copra, bgs, NY ... lb.	.0225	.0230	.02	.038	.0012	.021
Corn, crude, tks, mills ... lb.	...	.09¼	.08¾	.11	.03½	.09½
Refd, 375 lb bbls, NY .. lb.	.11½	.11¾	.11½	.14	.05¾	.12
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls, NY ... lb.	.05¼	.06¾	.04½	.06	.02¾	.05½
English, brown, bbls, NY lb.	.04¾	.05½	.04¾	.06½	.03¾	.05⅜
Greases, Yellow ... lb.	.05½	.05⅝	.05	.06⅝	.02⅜	.05⅛
White, choice bbls, NY lb.	.06⅛	.07¼	.05¼	.08½	.02¾	.05⅝
Herring, Coast, tks ... gal.	.33	Nom.	.23	.33	.15	.23
Lard Oil, edible, prime ... lb.	...	.20½	.09¾	.20½	...	.09¾
Extra, bbls ... lb.	...	.11¾	.08½	.11¾	.07	.08½
Extra, No. 1, bbls ... lb.	...	.10¼	.08¼	.11	.06⅜	.08¼
Linseed, Raw, less than 5 bbl lots ... lb.	...	.105	.091	.105	.101	.105
bbls, c-l spot ... lb.	...	.097	.083	.097	.087	.101
Tks ... lb.	...	.091	.0770	.091	.081	.095
Menhaden, tks, Baltimore gal.	.28	.30	.25	.35	.15	.25
Refined, alkali, drs ... lb.	.074	.078	.061	.078	.052	.069
Tks ... lb.	...	.068	.055	.069	.046	.061
Light pressed, drs ... lb.	.068	.072	.055	.072	.046	.057
Tks ... lb.	...	.062	.049	.063	.04	.05
Neatsfoot, CT, 20° bbls, NY ... lb.	...	.16¼	.16¼	.16½	...	.16½
Extra, bbls, NY ... lb.	...	.10½	.08½	.11¼	.07	.08½
Pure, bbls, NY ... lb.	...	.12¾	.11¾	.12¾	.12	.13
Oleo, No. 1, bbls, NY ... lb.	...	.13	.10¾	.14½	.06	.11½
No. 2, bbls, NY ... lb.	...	.12½	.10	.13¾	.05⅜	.11¼
Olive, denat, bbls, NY ... gal.	.80	.83	.82	.95	.76	.90
Edible, bbls, NY ... gal.	1.65	1.80	1.55	1.80	1.55	1.90
Foots, bbls, NY ... lb.	.08½	.08⅝	.07⅛	.08¾	.06½	.07½
Oticica, bbls ... lb.	.27	.28	.13½	.28	...	...
Palm, Kernel, bulk ... lb.	.03¾	.04	...	...	...	...
Niger, cks ... lb.	.04½	.04⅝	.034	.05¾	.031	.03¾
Sumatra, tks ... lb.	...	.04¼	...	...	...	...
Peanut, crude, bbls, NY .. lb.	...	.11	...	...	...	...
Tks, f.o.b. mill ... lb.	...	.09½	.08¾	.10¾	.06½	.10¾
Refined, bbls, NY ... lb.	...	.13½	.12½	.14	.07½	.12½
Perilla, drs, NY ... lb.	.10	.10¼	.07¼	.10¼	.08¼	.09⅝
Tks, Coast ... lb.	...	.08½	.068	.08½	.07½	.09
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.078	.0810	.07½	.09	.08	.082
Denatured, drs. NY ... gal.	.48	.49	.40	.53	.37	.44
Red, Distilled, bbls ... lb.	.09⅛	.10⅛	.07⅜	.10⅛	.06⅞	.08⅜
Tks ... lb.	...	.08¼	.06½	.08¼	.06	.06½
Salmon, Coast, 8000 gal tks ... gal.	.30	Nom.	.25	.35	.15	.21
Sardine, Pac Coast, tks .. gal.	...	.35	.24½	.37	.13	.25
Refined alkali, drs ... lb.	.074	.078	.065	.079	...	...
Tks ... lb.	...	.068	.06	.069	...	...
Light pressed, drs ... lb.	.068	.072	.055	.073	...	...
Tks ... lb.	...	.062	.049	.063	...	...
Sesame, yellow, dom ... lb.	.12½	.13	.12¼	.13¾	.07½	.13¼
White, dos ... lb,	.12½	.13	.12¾	.13¾	.08	.13¼
Soy Bean, crude						
Dom, tks, f.o.b. mills .. lb.	...	.087	.08	.10	.06	.08
Crude, drs, NY ... lb.	.093	.097	.086	.11	.066	.09
Refd, bbls, NY ... lb.	.098	.107	.091	.115	.071	.102
Tks ... lb.	.092	.097	.08	.10½	...	...
Sperm, 38° CT, bleached, bbls NY ... lb.	.099	.101	.099	.101	.106	.11
45° CT, bleached, bbls, NY ... lb.	.092	.094	.092	.094	.099	.103
Stearic Acid, double pressed dist bgs ... lb.	.10	.11	.10	.12¼	.09	.11
Double pressed saponified bags ... lb.	.10½	.11½	.09	.12¾	.09	.10
Triple pressed dist bgs .. lb.	.13	.14	.12¾	.15¼	.11¾	.13¾
Stearine, Oleo, bbls ... lb.	.11¾	.12	.09¼	.12½	.05	.10⅝
Tallow City, extra loose .. lb.	...	.06⅝	.05⅜	.07	.07⅞	.05⅜
Edible, tierces ... lb.	...	.08¾	.07¼	.08¾	.04¾	.07¼
Acidless, tks, NY ... lb.	...	.09¾	.07½	.10¾	.06	.07½
Turkey Red, single, bbls .. lb.	.07½	.08	.07½	.08	.07½	...
Double, bbls ... lb.	.12½	.13	.12½	.13	.12½	.13
Whale:						
Winter bleach, bbls, NY lb.	.077	.079	.07	.083	...	.072
Refined, nat, bbls, NY .. lb.	.073	.075	.064	.081	.064	.07

THE CHEMICAL MARKET-PLACE

Local Suppliers

A directory of responsible manufacturers' agents and jobbers maintaining spot stocks

THE CHEMICAL MARKET-PLACE

Wants & Offers

Rates—All classifications, $1.00 an insertion for 20 words or less, additional words 5c each per issue: 10c for forwarding mail if box number address is used. ¶ Three insertions for the price of two. Payment with order.

Chemical Industries
25 Spruce St., New York

Situations Wanted

AGRICULTURAL COLLEGE GRADUATE with seven years' sales and sales promotion experience in fertilizer and insecticide fields and experiment station experience wishes position in agricultural field. Now employed. Box 1116, CHEMICAL INDUSTRIES.

ANALYTICAL CHEMIST having three years' experience in the manufacture of fine chemicals. Box 669, CHEMICAL INDUSTRIES.

ANALYTICAL AND RESEARCH CHEMIST, 8 years' experience in textile, non-ferrous metals, and metallurgical field. Box 1111, CHEMICAL INDUSTRIES.

CHEMICAL ENGINEER, with two years' legal training and experience in coal tar products and paper research. Box 670, CHEMICAL INDUSTRIES.

CHEMICAL ENGINEER AND METALLURGIST. Seven years' in research and seven in steel metallurgy. Box 674, CHEMICAL INDUSTRIES.

CHEMIST, CHEMICAL ENGINEER. Johns Hopkins Honor graduate, experienced in the dyeing and finishing of rayon is seeking a position in chemical industry. Box 1115, CHEMICAL INDUSTRIES.

CHEMICAL GRADUATE—wants to learn chemical business. Experience preparing laboratory reagents. Two dependents. Oscar Williams, 207 S. Congress, Emporia, Kans.

CHEMIST, B.Sc., married. 15 years' extensive plant, laboratory, sales experience. Alkalies, Acids, Heavy Chemicals, Indigo, Nitration Products, Rubber, etc. Now employed. Box 1105, CHEMICAL INDUSTRIES.

CHEMIST who has specialized in industrial electro-chemistry and pyrometry. Box 671, CHEMICAL INDUSTRIES.

CHEMIST AND PLANT MANAGER having seventeen years' experience in making waterproof materials. Box 673, CHEMICAL INDUSTRIES.

COMMERCIAL CHEMIST having five years' experience in foods, oils, soaps, flaxseed, etc. Box 672, CHEMICAL INDUSTRIES.

INDUSTRIAL ENGINEER - ACCOUNTANT. Also chemical engineer. M.S. degree, M. I. T., scholarship man. Six years' experience chemist, chemical production, and accounting executive. Particularly interested scientific management and cost analysis. Member management societies, publications. Now employed in N. Y. Age 27. Salary required $3000 per year. Box 1122, CHEMICAL INDUSTRIES.

Situations Wanted

SALES REPRESENTATIVE for firm with products of merit to the paper manufacturing industry. Man 39 years old, university training, with wide acquaintance in and knows the paper industry. Experienced in marketing, including advertising, sales promotion, sales. Not a chemist. Box 1118, CHEMICAL INDUSTRIES.

PATENT CHEMIST, B.Sc., age 38, experienced all phases patent matters, desires position as Manager or Staff Member of corporation's Patent Division. Now engaged in private practice. Box 1106, CHEMICAL INDUSTRIES.

RESEARCH - SALES - DEVELOPMENT Chemical Engineer with twelve years' diversified experience sales and development of new processes in the chemical and paper industries. Thoroughly grounded in research with an impressive list of patents granted or pending. If you have a sales problem where technical background is essential, it will pay you to investigate my record. Box 1108, CHEMICAL INDUSTRIES.

SANITARY SPECIALTIES CHEMIST—ten years' experience manufacturing all kinds of disinfectants, insecticides, soaps, detergents, deodorants, polishes, cleansers, etc. Desires position as Supt. or Asst. Supt. of large plant. Employed, but available about Nov. 15. Age 42, single, B.S. 1920 C. I. T. Box 1114, CHEMICAL INDUSTRIES.

For Sale

FOR SALE: Exceedingly valuable practical manufacturing formulas, complete, for the essential oil industry. Formulas are suitable for large-scale production and cover synthetic flower oils, perfumes, essences—natural and artificial, for confectionery, soft drinks, foods and the liquor industry. Box 1113, CHEMICAL INDUSTRIES.

Business Opportunities

A LARGE CHEMICAL MANUFACTURING CORPORATION with widely diversified activities invites information concerning products which might form additions to its present lines, or furnish the basis for new lines. Contacts will be arranged with those who supply sufficient information in their initial letter to make possible at least a rough appraisal of the attractiveness of the proposal. Box 1117, CHEMICAL INDUSTRIES.

NEW PROCESSES OR NEW PRODUCTS: Chemical Manufacturer desires contact with men who have new processes for products with established markets, or for new products with potential markets. Box 1112, CHEMICAL INDUSTRIES.

PHTHALLIC ANHYDRIDE. English firm wish to purchase plans for the erection of a plant to produce phthallic anhydride. Opening for Chemist with previous experience of operating plant. Box 1123, CHEMICAL INDUSTRIES.

CONSULTING CHEMIST AND EXECUTIVE with following has twenty hours per week available for sales or contact work. Varied experience and proper representation assured. Box 1119, CHEMICAL INDUSTRIES.

MICROSCOPIC PHOTOGRAPHY — experienced Chemical Engineer, competently equipped to do microscopic or other technical photographic work, in colors if desired. W. C. McIndoe, 511 Jersey Avenue, Elizabeth, N. J.

RESPONSIBLE AND CAPABLE MEN OR SALES ORGANIZATIONS WANTED — to sell our line of shoe polish, furniture polish, and floor wax. We manufacture popular priced, high quality products — attractively packaged for rapid sales turnover. Lucrative proposition to right men. Write complete details. Box 1121, CHEMICAL INDUSTRIES.

WANTED, one capable Agent in each Country throughout the World for quality boot polishes. Manufacturers: Industrial Works, Sikandrabad, U. P., India.

CHEMICAL ENGINEER desires contact financial interests with view establishing chemical manufacturing enterprise. Number years experience manufacture copper, zinc and barium chemicals direct from ores. Box 1120, CHEMICAL INDUSTRIES.

WISH CONNECTION with a person interested in Wood Chemical Industry, for organizing a saw mill as a chemical plant. For details, John Pekko, Limones, Esmeraldas, Ecuador, S. A.

Index to Advertisers

Index to Advertisers

"We"—Editorially Speaking

At the special request of Artist Norman Rockwell, we publish the above, with the explanation that this is NOT the portrait of John Chew and daughter he painted for the *Satevepost* cover.

❖❖❖❖

Says our sprightly contemporary, *The Pioneer*: "Hemlock bark, waste material of the pulp industry, is found to be rich in tannin"—well, well, so it is, as the tanners have known for the last five hundred years.

❖❖❖❖

The Consumers Research Bureau laboratory closed by a walkout of their 41 employees . . . The AAA put on a budget . . . Soviet sailors jailed because they refuse to mutiny . . . Workers at chemical plant ask for an increase in hours—apparently our old friend the labor problem has gone over to the lunatic fringe.

❖❖❖❖

One of the Victor Chemical Works executives, who once upon a time bought a lot of midwest public utilities over against his declining years, complains bitterly that when the Secretary of the Treasury supports the Federal bond market, he is only doing just what they tried to put Samuel Insull in jail for trying to do.

❖❖❖❖

Our own Chemical Tourist is on the road again (as Collier's says, there's a treat in store for our readers) and reports from Buffalo that, having packed his bags, he sent them by a porter to the Niagara Street door with instructions: "Put in the back of my car; it's a bottle green convertible roadster with the top down; New Jersey license plates." Having checked out, he was surprised to find his car right in front of the door and his luggage piled neatly in the middle of the sidewalk. The porter rushed up frantically. "Ah's been lookin' f' your cah, suh."

"There it is, right there."

"Yo' cain't fool me, suh. Yo said Bottle green roadster, and ah jest knows that's a Buick."

❖❖❖❖

During this busy season a busy vice-president in charge of sales was forced to break an engagement with a smallish, very touchy buyer of chlorine, and when it was necessary to break a second appointment he sent down a trusty lieutenant famous for his diplomacy. Next day this envoy reported to his chief that the customer was more than disturbed.

"What did he say?"

"Well, to begin with, he called you a 'high hat', a great big 'stuffed shirt', a 'four-flushing cheese,' a '——.' "

"Who said this?" interrupted the vice president in charge of sales.

"Why the customer!"

"Well, you needn't be so damned enthusiastic about it."

❖❖❖❖

Speaking very personally as we have just been, the president of one of our leading solvents companies received recently the following handwritten letter:

"Dear Mr. ———

Dear Sir:

Although not knowing you personally, I am constrained to write you about the very pleasant time which I have enjoyed working for your company. My brother-in-law, Sam Harris, who married my youngest sister, Ella, is going to open a tourist camp near Pikesville, and I am hereby handing my resignation to Mr. Howard to take effect in order that I may take charge of his hot dog department. Although, as I said, not knowing you personally, I want to write my appreciation of your considerate treatment of me when I broke my left forearm last June in two places. Thanking you, I beg to remain,

Respectfully yours,

_____________"

❖❖❖❖

Did you know that—

There ain't no such thing as a "colloid"?

The trade name "Roman alum" comes from the monopoly once owned by the Popes on alum made by a secret Arabian process?

Saccharine was the first coal-tar derivative of commercial importance discovered in America?

❖❖❖❖

Now that the President has made such a fine start asking the clergymen how he should run the country in a form letter devised by Bob La Follette, maybe Charlie Parsons will be called upon to write a form letter to the chemists to go out under a White House frank.

Fifteen Years Ago

From our issues of October, 1920

Henry Howard, Grasselli Chemical, Cleveland, and E. G. Miner, president Pfaudler Company, Rochester, N. Y., attend annual meeting of the Foreign Trade Council at Biltmore in New York.

New plant of Stauffer Chemical, at Stege, Cal., erected at cost of $600,000, to be devoted to sulfuric acid production, is ready for operation.

Grasselli Medal awarded Dr. Allen Rogers, of Pratt Institute, Brooklyn, N. Y., at joint meeting of the American Section Society of Chemical Industry and the N. Y. Section of the Societe de Chimie Industrielle.

F. W. Devoe and C. T. Raynolds Co., Newark, N. J., manufacturer of artists supplies and paints, have plans prepared for one-story addition to plant.

The Chemical Club of Philadelphia formed to promote closer relations in the trade.

Hercules Powder completes negotiations for purchase of Yaryan Rosin and Turpentine Co. for $2,250,000.

Carbide & Carbon Chemicals, Inc., Manhattan, incorporated to make oil and gas products. Capital 100,000 shares of common stock, no par value; active capital $500,000.

Union Carbide & Carbon Research Laboratories, Manhattan, incorporated for the purpose of making hydrocarbon experiments.

The Business Magazine of

CHEMICAL INDUSTRIES

Including "Chemical Markets"